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**A RETROSPECTIVE STUDY: EXPLORING SELECTED CHARACTERISTICS OF
TELENURSING TRIAGE**

**A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science**

BY

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B.S.N., Valdosta State University, 1989**

**2001
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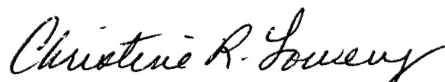
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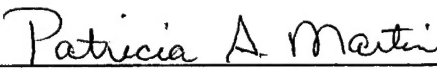
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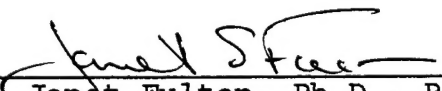


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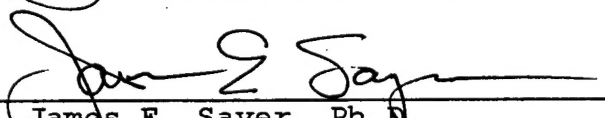


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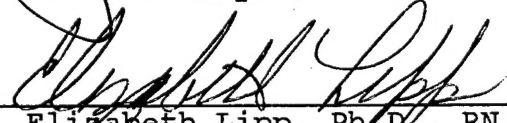
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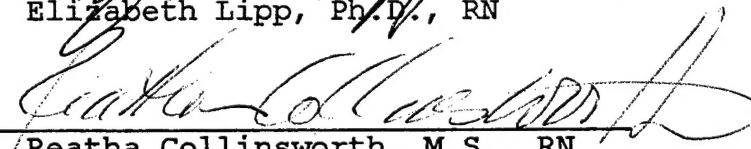
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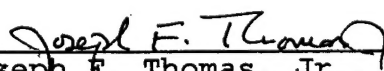
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ABSTRACT

Lowery, Christine Renee. M.S., Wright State University-Miami Valley College of Nursing and Health, Wright State University, 2001. A Retrospective Study: Exploring Selected Characteristics of Telenursing Triage.

Telenursing has proliferated in the past several years. Telenursing, as with any new subspecialty of nursing practice, is experiencing growing pains and uncovering problems as the practice evolves. Researchers have referred to communication during the telephone interaction as problematic related to the fact that only verbal communication is involved. There is little known about the relationship between quality of communication and the eight symptom dimensions in telenursing.

A retrospective, descriptive correlational design was used to investigate selected characteristics of telenursing triage. A sample of 93 paper, computerized telenursing triage notes were audited using the Content Analysis of Quality of Communication and Selected Variables Tool designed by the researcher.

The dependent variable was the communication scores from eight symptom dimensions based on the assessment phase of the nursing process. Data were analyzed for relationships among veteran age, time of day, nurses' years of experience, disposition of call, and symptom. This study described selected characteristics in telenursing triage and determined a relationship exists between quality of communication, nurses' years of experience, and call disposition.

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I. INTRODUCTION

Telenursing triage has been reported in the literature since 1960 and is an effective and efficient way to provide treatment and care in a number of settings and with a variety of populations. In the past, telenursing triage existed as part of the physician's practice with nurses providing home-care advice and determining need for an appointment. Today, telenursing triage is expanding and nurses are being consulted via telephone for routine checks on health status, primary care advice, health counseling, utilization control, customer satisfaction, and true triage. Telenursing triage is a major vehicle for improving access and encouraging the appropriate utilization of health care services. Telenursing triage is fast becoming a major area in nursing practice as evidenced by the increase in telenursing in ambulatory care settings and managed care call centers around the country.

The literature provides a well-developed body of knowledge identifying communication between health care provider and client as an important process. Nursing education programs teach communication as a basic element in the nurse's delivery of total care and nurses are provided with information about factors that influence communication such as perceptions, values, sociocultural background, knowledge, roles and relationships, and environmental setting. Consequences of poor communication can

lead to lawsuits (Bernzweig, 1980, 1985; Cushing, 1992) and avoidable client deaths (Greenlaw, 1982). This retrospective, descriptive correlational study investigated quality of communication and selected variables in telenursing triage.

Statement of Problem

It is known that face-to-face communication is problematic between health care providers and clients. Telenursing triage usually incorporates training in the use of protocols and/or use of telecommunication equipment. Little is known about telenursing triage and the quality of communication between telenurse and veteran as it relates to eight symptom dimensions.

Statement of Purpose

The purpose of this retrospective, descriptive correlational study was to explore selected characteristics of telenursing triage. In particular, this study examined the relationship between quality of communication in telenursing triage notes and selected veteran, call, and telenurse variables, symptom, and disposition of call. This study also examined the relationship between quality of communication and eight possible dimensions of a symptom – onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of the symptom. Quality of communication was defined as the thoroughness with which telenurses probe the eight symptom dimensions of veteran-reported symptoms.

Veteran characteristics were age, gender, and location of primary provider. Call characteristics were length of call and time of day. The telenurse characteristics were age, years of nursing experience, and nursing specialty. This retrospective study explored

quality of communication by evaluating and scoring paper/computerized telenursing triage notes in a Midwest Veteran Affairs Medical Center. Understanding trends in communication in telenursing triage may help with establishing computerized simulations and activities for learning in telenursing triage and communication.

Research Questions

1. What are the veteran characteristics (age, gender, and location of primary provider) of veterans who use the telenursing triage call center?
2. What are the call characteristics (time of day and length of call) of veteran calls placed to the telenursing triage call center?
3. What are the characteristics (age, years of experience, and nursing specialty) of the telenurses providing symptom-related advice to veterans?
4. What is the disposition (emergency room, same day appointment, self-care, appointment within seven days, and urgent) of telenursing triage calls?
5. What are the most frequently reported symptoms by veterans to the telenursing triage call center?
6. What is the relationship between analysis of quality of communication and veteran age, time of day, nurse's years of experience, disposition of call, and symptom?

Significance and Justification

The significance and justification of this retrospective study involved consideration of three issues in telenursing triage practice. The first issue of concern was telenursing communication and the lack of training at practice level and the lack of

nursing education curricula about this relatively new area of nursing practice. The second issue involved telenursing triage and quality improvement to ensure the advancement of telenursing practice. Finally, the issue of cost savings is an integral part of any health care program.

Telenursing triage is radically different than other areas of nursing practice; however, there appears to be an assumption that interviewing skills used in face-to-face communication are immediately transferable to the telephone. The literature reviewed does not support this assumption (Hoare, Lacoste, Haro, & Conyers, 1999; Jarrett & Payne, 1995; Callis-Verhallen, Kerkstra & Bensing, 1998; Larsen & Risor, 1997; Marsden, 2000). A review of literature by Caris-Verhallen, Kerksta, and Jozien (1997), which focused on nurse-client communication, concluded that nurse-client communication for the most part is ineffective.

Telenurse-client communication has an additional disadvantage during the communication process – the loss of nonverbal cues. The telenursing triage advice given is based on information provided by an untrained observer – the client. The absence of visual cues presents a challenge to telenurses' communication skills, with total reliance on verbal communication. The client may not know enough to share the most pertinent and critical symptoms, or may not recognize what is normal or abnormal.

Communicating effectively with the client in order to get the necessary information to give appropriate advice becomes paramount to the telenurse; therefore, there is a need for specific training and education in telenursing and communication at the practice level and in nursing education curricula.

Since telenursing triage is being increasingly utilized as a means of nursing care, it is important for telenursing triage call centers to have data on their own telenurse services in order to identify areas for improvement. Quality health care is an expectation of clients, their families, and the public. Improvement activities are organized to evaluate quality and appropriateness of care to meet these expectations and fulfill professional responsibilities. Most practices have a plan that describes the objectives, organization, scope, and method for monitoring, evaluating, and improving activities. Quality improvement is crucial to the provision of quality health care and allows the health care institution to compete in today's continuously changing health care environment.

Viewpoints abound and differ as to which indicators provide the best information about performance and opportunities for improvement in telenursing triage (Hoare et al., 1999). Most agree that the best indicators provide insight into the behavior of individual nurses providing telephone triage advice as well as the system of telenursing triage. The three indicators frequently identified were: documentation, clinical guidelines, and competency. Documentation and clinical guidelines are easily accessible and simple to monitor. Competency of telenurses is easy to monitor; however, the exact skills needed for telenursing triage – clinical skills as a generalist or specialist, negotiating skills, problem identification and management skills, triage skills, interpersonal skills, and communication skills – have not been agreed upon (Hoare et al., 1999).

The shifting focus of delivery of care from inpatient to the outpatient setting has sparked a number of changes in the way nurses approach client care. The shift has also challenged health care professionals to think of new cost-conscious ways of managing

clients while maintaining quality health care; hence, the proliferation of telenursing triage. Key arguments for implementing telenursing triage are improved quality of care, access, reimbursement, and cost reduction (Sabin, 1998). Telenursing triage is an access tool for clients that can increase patient satisfaction with their health care and health plan, as well as their compliance with telephone advice. Moreover, telenursing triage may become an almost required tool for capitated entities, especially for health plans, since under capitation, the ability to control demand is necessary to manage costs as well as care.

Payers and consulting organizations report average annual savings of \$50 to \$240 per member using telenursing triage. In 1996, Blue Cross Blue Shield of Oregon and Access Health, Inc., a telephone triage vendor, conducted a study of Medicaid claims data. This study, assisted by Hewitt Associates, compared 14,000 members who had access to telephone triage service to 14,000 members who did not. The study showed savings of \$184 per member per year for members with access to telephone triage (Sabin, 1998).

This study examined the relationship between the quality of communication in telenursing triage notes and selected veteran, call, and telenurse variables, symptom, and disposition of call. This study also examined the relationship between the quality of communication and eight possible dimensions of a symptom – onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of the symptom. The major concepts and variables in this study were defined.

Definitions of Terms

The concepts explored and described in this study were: telenursing triage, quality of communication, veteran (client) characteristics, symptom, eight symptom dimensions, call characteristics, telenurse characteristics, and disposition of call.

Telenursing

The variety of names used to identify the telenurse's role in providing health care advice via the telephone point to the lack of clarity over this role. The American Academy of Ambulatory Care Nursing (AAACN, 1997) defined telenursing as

using protocols, algorithms, or guidelines to systematically assess
and address client needs and prioritizing the urgency of client needs.

Telenurses develop a collaborative plan of care with clients and their support systems. The plan of care may include: wellness promotion, prevention education, advice, health counseling, disease state management, care coordination, and evaluating outcomes of practice and care. (p. 9).

The concept telenursing triage is described as registered nurses, with use of peer-reviewed or physician-reviewed triage algorithms often from electronic databases, working with clients to determine the nature and severity of the condition, the appropriate treatment options, and how soon treatment should be sought. Telenurses do not diagnose; they impart information to clients and advise clients about the level of care needed. Clients make the final choice about seeking care (Nauright, Moneyham, & Williamson, 1999).

For the purpose of this study, telenursing triage was the utilization of physician-reviewed algorithms to assess veteran-initiated, symptom-related calls. The Veteran Affairs Medical Center, where the teleursing triage call center is located, operates from 4:00 p.m. until 9:00 a.m. seven days a week with 24-hour coverage provided on Saturday and Sundays. The telenurse interviewed and assessed the veteran by obtaining a history of the symptom, which included eight symptom dimensions in order to determine the appropriate nursing diagnosis and plan of care. The telenurse advised the veteran concerning disposition to emergency room, same day appointment, self-care, appointment within seven days, and urgent care based on protocols/guidelines. The interaction between telenurse and veteran was documented during the interaction in the veteran's medical record via computer. Computerized paper copies of the interactions were printed, placed in binders, and maintained in the telenursing triage office.

A study by (Hoare et al., 1999) explored indicators of telenursing triage quality using Salzer's (1997) relational quality framework and Donabedian's (1980) definitions of structure, process, and outcome to determine quantity and specific type of assessment information; telenursing triage documentation in free text; number of protocols used in a typical call; relationships among characteristics of telenursing triage calls; characteristics of telenurses, documentation, protocol use, and call disposition; and number of visits to a health care facility after a telephone call.

Call characteristics and nurse characteristics were defined as structure indicators. Assessment documentation and protocol use were defined as process indicators. Level of disposition was defined as an outcome indicator. The investigator in this study assessed

quality of communication using the structure indicators call characteristics and telenurse characteristics, and the process indicator was documentation of assessment of eight symptom dimensions.

Quality and Communication

Health care is the activity between practitioner and client and is described by Donabedian (1980) as “process” of care.

A judgment concerning the quality of that process may be made either by direct observation or by review of recorded information, which allows a more or less accurate reconstruction of what goes on. But, while process is the primary object of assessment, the basis for the judgment of quality is what is known about the relationship between the characteristics of the health care process and their consequences to the health and welfare of individuals and of society, in accordance with the value placed upon health and welfare by the individual and by society. (p.23).

Quality occurs when the telenurse adheres to established clinical criteria and standards of care; for example, documentation of protocol use and assessment and referral to appropriate disposition option (AAACN, 1997). Communication skills such as effective listening, assertiveness, negotiation, and counseling are competency criteria that are essential to facilitate ongoing care and treatment.

A well-known methodology for measuring communication, content analysis, has been utilized in numerous disciplines such as psychology, political science, literature, history, anthropology, linguistics, and, more recently, the health care discipline. Content analysis as defined by Berelson (1952) is the “objective, systematic, and quantitative description” of communication content (p. 3).

Four advantages of content analysis potentially make it a more powerful technique than questionnaires or interviews for describing the nature of communication and for inferring the relationship between input variables, communication, and outcomes (Krippendorff, 1980). First, content analysis is an unobtrusive technique because it studies texts that already exist rather than having researchers get people to produce texts. Secondly, content analysis accepts unstructured material, which observers categorize. Thirdly, questionnaires and interviews often obtain data in settings far from the context in which the communication occurs, but content analysis studies the data as they appear in context. Finally, content analysis is able to handle massive amounts of data, especially with the increased use of computers to store information.

Content analysis can be used for many purposes, and Weber (1985) compiled a list of examples (adapted from Berelson, 1952) indicating several uses which include the following: audit communication content against objectives; code open-ended questions in surveys; identify the intentions and other characteristics of the communicator; describe attitudinal and behavioral responses to communication; reflect cultural patterns of groups, institutions, or societies; and describe trends in communication content. Two of Berelson's (1952) examples were identified as appropriate for utilizing content analysis

as the methodology for this study – auditing communication content against objectives and describing trends in communication content.

Content analysis was utilized in this study to code and categorize telenursing triage notes in order to analyze communication between telenurse and veteran. Auditing the telenursing triage notes against objectives informed the investigator about what was being communicated. The pre-selected objectives in this study were eight symptom dimensions and include the following categories: onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of symptoms. The basis for the judgment of quality of communication was determined by what was known about the relationship between characteristics of the telenurse and veteran interaction. A Likert scale, consisting of five possible scores, was utilized to determine quality of communication and included the following scoring categories: 4 = excellent, 3 = above average, 2 = average, 1 = below average, and 0 = extremely poor (See Appendix A).

Communication is the management of messages for the purpose of creating meaning (Frey, Botan, Friedman, & Kreps, 1991). There are two perspectives on communication: the information-based view and the meaning-based view. Miller (1951) defines information-based view of communication as information being passed from one place to another (p. 6). Thayer (1986) defines meaning-based view of communication as communication occurring whenever an individual assigns significance or meaning to an internal or external stimulus (p.43). Communication occurs whenever a person attempts to send a message or whenever a person perceives and assigns meaning to behavior.

Communication is an ongoing, dynamic series of events that involves the transmission of language from sender to receiver. There are five levels in which to study communication intrapersonal, interpersonal, group, organizational, and societal. For this study, interpersonal communication between telenurse and veteran is the primary focus.

Interpersonal communication was the exchange of language, via telephone, between the telenurse and veteran occurring through the VAMC telenursing triage call center. The telenurse and veteran were sending and receiving symptom-related health care information via telephone. The telenurse listened to the veteran to determine the stimulus to seek health care, which enabled the telenurse to give structure to the problem and establish a chronological and sequential framework. At this point, the telenurse begins to ask relevant questions related to the veteran's chief complaint. Below is a sample of relevant questions the telenurse may have asked the veteran.

1. Where are the symptoms located? If they seem to move, what is the range of their movement? What is the client doing when the symptom occurs – working, playing, active or resting?
2. When did the symptom begin? Does it come and go? If so, how often and for how long? What time of day does the symptom occur? Day of week?
3. What does it mean to the client? What does it feel like? Has it been bad enough to interrupt the flow of the client's life? What makes it feel better? Worse?
4. How did it come about? Is there illness in the family? Have there been similar episodes in the past?

The previously mentioned questions incorporate several open-ended questions in order to facilitate communication between the telenurse and veteran. It is well known that open-ended questions improve communication (Caris-Verhallen, Kerkstra, Bensing, & Grypdonck, 2000; Schrader & Schrader, 2001; Williams, 1998). Open-ended questions and veteran responses provide the telenurse with sufficient information to determine a nursing diagnosis, which in turn, enables the telenurse to make a decision about what health care advice to provide the veteran.

Veteran (Client) Characteristics

A military veteran is a former member of the armed forces (American Heritage, 2000, p. 1346). The veteran characteristics in this study were age, gender, and location of primary provider. The characteristic, location of primary provider, referred to the geographical location of the primary source of health care for the veteran and was either a Veteran Affairs Medical Center (VAMC) or clinic.

For the purpose of this study, the client was the military veteran who met the eligibility criteria for Veteran Affairs health benefits which includes access to the telenursing call center. The VAMC call center in this study provides telenursing advice to approximately 210,000 veterans who live in Regions 10, 11, and 12, and encompasses Ohio, Michigan, Illinois, Indiana, New York, and parts of Texas, Georgia and Florida. Due to the extensive telenursing triage services provided throughout numerous states, five locations from the state of Ohio were selected for the sample: Dayton, Cleveland, Columbus, Chillicothe, and Cincinnati. These five cities were selected due to the size of the veteran population in these areas to ensure an adequate sample size.

Symptom and Symptom Dimensions

The concept symptom was the subjective data gathered during the interview of the veteran about the history of the illness. Telenursing triage documentation of the interview provides a description of all symptoms that may be related to the chief complaint and describes the problem chronologically, dating events and symptoms (Seidel, Ball, Dains, & Benedict, 1999). Symptoms, as defined by DeGowin and Brown (2000), are the abnormalities perceived by the client's own senses and conveyed to the health care provider during the history-taking portion of the assessment (p. 13).

Symptom was the subjective, abnormal sensation reported by the veteran to the telenurse, which was documented in the telenursing triage note. The symptom was coded and categorized using content analysis to determine the most frequently reported symptom by the veteran. Each symptom was evaluated to determine if the eight symptom dimensions were addressed during the communication interaction between the veteran and telenurse. The eight symptom dimensions are listed as follows: onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of symptoms.

Call Characteristics

The information-based view of communication is that information is passed from one place to another (Miller, 1951), whether, face-to-face or via telecommunication equipment. The telephone call is an ongoing, dynamic series of events that involves the transmission of language from sender to receiver. There is always a sender and a receiver in communication or at least an intended receiver. The sender and receiver each have

personal realities and they each have their own world formed by their experiences, their perceptions and their ideas. They will perceive, experience, and interpret things differently. The participants must have some kind of concept of each other's location and of a possible channel of communication existing between them. To achieve effective communication, one needs to take all these factors into consideration – the different realities, the space the communication takes place in, verbal as well as non-verbal messages, and the intended meaning versus the perceived meaning (Schramm, 1954).

Call characteristics have been defined in previous studies as hour of shift, day of the week, month of call (Hoare et al., 1999); length of call, reasons for call (Twomey, 2000); and frequency of calls (Lattimer et al., 1998). For the purpose of this study, call characteristics were the time of day and length of call of the symptom-related communication interaction between veteran and telenurse at the VAMC telenursing triage call center. Since the weekend coverage extends to 24-hour coverage, the time of day of the telenursing call was divided into two time frames: AM (0001 – 1200) and PM (1201 – 2400). Length of call was the number of minutes that the telenurse and veteran interacted during the telenurse call.

Telenurse Characteristics

The American Academy of Ambulatory Care Nursing (1997) defined telenursing as the provision of care for individuals, families, and client populations through assessment of actual or potential health needs, health promotion, education, counseling and decision support, and coordination of care (p. 9). Telenurse characteristics in previous studies have been defined as perception of call length, hourly work status,

competency (Hoare et al., 1999); and years of experience (Wachter, Brillman, Lewis, & Sapien, 1999).

This study was limited to five telenurses located at the VAMC telenursing triage call center, who are registered nurses providing health care advice to veterans calling to request symptom-related advice. The telenurse characteristics were age, years of experience, and nursing specialty. The telenurse's years of experience referred to the amount of time the telenurse has been actively involved in providing nursing care to clients. Nursing specialty was the primary area of focus in nursing practice where the nurse provided health care to clients. The five telenurses in this study specialized in either critical care or medical-surgical nursing.

Disposition of Veteran Call

Disposition, as defined by Merriam Webster (2001, p. 407), is to settle or decide a matter. The telenurse uses problem-solving and decision-making processes to determine the correct disposition of the veteran for symptom-related calls. Disposition of call has been defined in previous studies as emergency room, same-day appointment, future appointment, and call back (Hoare et al., 1999); clinic, emergency room, referral to primary provider (Schwartz, Genovese, Devitt, & Gottlieb, 2000); and telephone advice only, appointment next day, and emergency department now (Crane & Benjamin, 2000).

The five disposition categories in this study were: emergency room, same day appointment, self-care, appointment within seven days, and urgent (within two hours). The telenurse's determination of the appropriate disposition of the veteran was based on the information provided by the veteran as to whether the call was emergent or non-

emergent. Emergent veteran calls were dispositioned to the emergency room and/or urgent care (within two hours). Non-emergent calls were dispositioned to same-day appointment, appointment within seven days, and self-care advice.

Summary

Communication plays a significant role in telenursing triage. Nurses have been taught to assess, diagnose, plan, implement, and evaluate nursing care relying on verbal and non-verbal communication within the nurse-client relationship. In telenursing triage, half of the communication skills used in the face-to-face interview (ie., non-verbal communication) cannot be utilized. The telenurse must now rely on verbal communication only to seek symptom-related health information, from the veteran, to establish the nurse-client relationship, which is challenging at best. Communication training and education for telenurses are essential in today's health care environment in order to improve access, improve telenursing practice, and assist clients in the appropriate utilization of health care services.

The purpose of this retrospective study was to utilize content analysis to code and categorize telenursing triage notes by using pre-determined categories and to explore and describe quality of communication and selected characteristics in telenursing. The concepts quality, communication, symptom, and telenursing were defined. The variables veteran characteristics, telenurse characteristics, call characteristics, symptom characteristics, and disposition of call were also addressed. Understanding communication trends in telenurse-client interactions may highlight the need for, and

help with establishing, computerized simulations and activities for learning in telenursing triage training programs and nursing education curricula.

II. REVIEW OF THE LITERATURE

Schools of nursing emphasize communication and human interaction with clients as cornerstones to effective nurse-client relationships. Communication requires a sender and a receiver, and when client and nurse are in synchrony with each other, communication generally is not a problem. When both speak the same language and the senses are not impaired, communication occurs. In the context of telenursing triage, effective communication requires good interviewing skills. This chapter discusses the concepts telenursing triage; quality; communication; symptom and symptom dimensions; veteran (client), telenurse, and call characteristics; and disposition of call. A framework and Schramm's (1954) theory of communication is also discussed. A schematic diagram is presented to depict the relationships among the major concepts. Assumptions are discussed at the end of the chapter.

Telenursing and Communication

Telenursing Triage - Background

Telenursing triage as an element of nursing practice is relatively new and it has been only in the past several years that there has been an effort to organize and standardize telenursing triage as a practice subspecialty. In 1999, a two-year study of the 50 State Boards of Nursing was completed. The purpose of the study (Rutenberg, 1999a) was to identify the existing policies that guide telenursing triage practice and to define the

extent of the differences among the states. The findings revealed significant discrepancies among states in policies and opinions about telenursing triage. The study also includes the following research findings:

1. Few if any states have defined telenursing triage or written standards specific to telenursing triage. The language of telenursing triage is vague, with decision-support tools called protocols, standing orders, or guidelines among different states.
2. Fifteen states have a document that addresses telenursing triage practice; however, only two of these states have formal position papers or interpretive statements regarding this practice.
3. Only seventeen of the states anticipate upcoming legislation or regulatory action relative to telenursing triage.
4. Guidance on these and other issues relative to telenursing triage practice is not readily available from all Boards of Nursing.
5. The most controversial issue is the role of the LPN/LVN. Twenty-three states take the position that LPN/LVNs may not perform telenursing triage because they are not licensed to do independent assessment.

The research study by Rutenberg (1999a) also indicates "it is possible that the skills of client assessment by telephone and decision making under conditions of extreme uncertainty should be incorporated into nursing curricula at the baccalaureate level" (p. 8). Both education and experience are presumed significant in establishing competency in telenursing triage; however, it is not known which of these factors are

more significant and research is needed in this area. The findings of the research are being shared with Boards of Nursing to bring recognition of the scope of the problem and to encourage further research.

A literature search of CINAHL, Healthstar and Medline, using key words communication, telenursing triage, telephone nursing, telenursing triage documentation, and telephone triage, did not yield literature related to observational studies and/or conversational analysis of telenurse-client communication; however, the search did yield one study regarding the relationship between analysis of the eight symptom dimensions and quality of documentation in telenursing triage notes. Research studies to date have mostly focused on investigating and collecting data on decision-making skills, demographics and characteristics of clients, outcomes, protocols and documentation as it relates to nursing language and interventions.

Telenursing triage, is “exchanging information, providing health education and advice, managing symptoms, or doing triage over the telephone” (Huber & Blanchfield, 1999, p. 38). Communication via telephone is different than face- to-face communication in that telenursing involves verbal communication only, whereas, face-to-face communication involves both verbal and non-verbal communication. In telenursing triage, the advice given by the telenurse is based on the information provided by an untrained observer – the client.

The absence of visual cues presents a challenge to the telenurse’s communication skills, with total reliance on verbal communication. The veteran may not know enough to share the most pertinent and critical symptoms, or may not recognize what is normal or

abnormal. Communicating with the veteran in order to collect the necessary information to give appropriate advice becomes paramount to the advice giver, and the emphasis is that of an expert communicator, the telenurse, assisting veterans in making their own health care decisions and negotiating a mutually satisfactory solution to the problem (Robinson, Anderson, & Erpenbeck, 1997). Unfortunately, there is limited knowledge in telenursing triage practice and one of the most important components in the telenurse-client relationship – quality of communication.

Telenursing triage is not a new role for nurses and has been around since the 1960s when nurses in physician's offices would provide advice and triage to clients over the phone. Today, telenursing triage has assumed new prominence as a means of promoting appropriate use of health care services and ensuring that consumers are matched with the most appropriate and least costly services. Health maintenance organizations (HMOs) have instituted telephone advice as a primary gate-keeping mechanism, and this trend of using telenurses in demand management has significant implications for future roles of telenurses and for the nursing profession (Naughtright, Moneyham, & Williamson, 1999). Research into outcomes of telenursing triage (Delichatsios, Callahan, & Charlson, 1998; Stirewalt, M. Linn, Godoy, Knopka, & B. Linn, 1982) indicates patient satisfaction with this service and it is estimated by the year 2001, one hundred million persons will be signed onto some sort of telenursing triage service.

Since telenursing triage is being increasingly utilized as a means of health care, it is important for nursing practices to have data on their own telenursing triage services including clinical outcomes and client satisfaction in order to remain competitive and to identify areas for improvement. A review of literature yielded two research studies by physicians (Delichatsios et al., 1998; Stirewalt et al., 1982), who investigated client satisfaction with telemedicine and the findings indicate overall satisfaction with telemedicine as high ($F = 1.79, p = < 0.05; p = 0.007$ respectively).

In a recent research study, Schwartz, Genovese, Devitt, and Gottlieb (2000) investigated client satisfaction with a telenursing call center at a Veteran Affairs Medical Center. Surveys were mailed to veterans and of those who responded, 83% rated the telenursing triage program as excellent. Comments on the patient satisfaction survey indicate that veterans appreciate receiving immediate assistance from a knowledgeable nurse instead of being shuffled from one voice mail to another. Another frequent comment is that the telenurse helps cut through red tape when dealing with medications and appointments. When reviewing the literature, telephone care programs consistently rated high on patient satisfaction surveys.

Nursing literature is limited concerning the investigation of adherence to advice as a telenursing triage outcome; however, several medicine studies have investigated client adherence with telephone advice. A telemedicine study by Crane & Benjamin (2000) investigated adherence as it relates to three areas of disposition of call: (a) telemedicine advice only, (b) appointment next day, and (c) emergency department now. The findings indicate adherence to the three disposition of calls as 90.4%, 73.2%, and

93.5% respectively. Another telemedicine study also investigated adherence to telemedicine advice and found the overall adherence rate to physician recommendation to be high (Delichatsios et al., 1998). As mentioned previously, telenursing triage literature is limited and research is very much needed in the areas of quality of care, outcomes, patient satisfaction, access to care, client adherence, and telenurse-client communication.

Quality

For the purpose of this study, the definition of quality was based on Donabedian's (1980) definition as it relates to health care. Donabedian discussed quality and the simplest module of care as the management by a primary practitioner of a clearly definable episode of illness in a given client. Technical care is the application of the "science and technology" of health care and the "art" of health care is the management of the social and psychological interaction between client and practitioner (p. 4). Donabedian also states "since technical care is neither completely nor exclusively a science and interpersonal care is capable of becoming at least in part a science, the distinction between science and art can be accepted only as an imperfect representation of the distinction between technical and interpersonal care" (p. 4).

Structure, process, and outcome are the three major categories of Donabedian's Model of Evaluation. Quality was evaluated under process and refers to standards and expectations of health care practitioner's in the management of health care – whether the care given is considered good, competent, or preferable practice. Evaluation examines the technical effectiveness and the management of the interpersonal process by assessing the

practitioner's performance during the management of health care. The category of process includes not only activities but also procedural end points, such as selecting a nursing diagnosis. Quality is the adherence to professionally defined standards of care.

A research study by Hoare et al. (1999) investigated whether documentation, use of clinical guidelines, and nurse competency were the best indicators of quality telenursing triage by examining relationships between these indicators and the characteristics of a telenurse call. The findings indicate a statistically significant relationship between the amounts of assessment information documented and call length ($F = 7.7, p = 0.0005$); nurse status ($F = 6.58, p = 0.0002$); chief complaint ($F = 4.68, p = 0.001$); interpersonal skill ($F = 9.64, p = 0.0001$); and urgency determination skill ($F = 5.33, p = 0.001$). The findings indicate that telenurses who are expert at relating to people probably are able to elicit more information from clients and therefore document more information.

In a review of literature by Crouch and Dale (1998), 14 studies between 1974 and 1995 were evaluated to explore telenurses' assessment and decision-making skills through simulations. The studies varied significantly in types of simulations presented, subjects of the study, development of simulations, and delivery of simulations and the process measures used to assess the interactions. There were limiting factors in several of the studies: (a) lack of methodological rigor in the design and validity of the simulations presented, (b) lack of consent from the research subjects, small sample size, and (c) criteria used to assess accuracy have not been validated. Their findings indicated an estimation for adequacy and appropriateness of assessments and decision-making skills

ranged from 50 to 74 percent and concluded that further research is needed to determine if accuracy of assessment and decision-making can be improved.

Communication

Communication is a broad, abstract term imposed on a large collection of processes. The structure of the communication discipline is based on speech and journalism incorporating both face-to-face human communication and mediated communication perspectives (Frey, Botan, Friedman, & Kreps, 1991). In the first half of the twentieth century, communication research typically involved mass media. The second half of the twentieth century witnessed investigators from numerous fields such as anthropology, psychology, sociology, education, and philosophy studying communication (Severin & Tankard, 1988, Chap. 1). Communication is multidimensional and there are five levels in which to study communication: intrapersonal, interpersonal, group, organizational, and societal. This study focused on interpersonal communication in a telenursing triage call center established for military veterans.

Interpersonal communication is communication between two people, either face-to-face or through mediated forms, such as the telephone, characterized by the mutual awareness of each other. In telenursing triage, the loss of nonverbal communication is a liability for the nurse who has practiced bedside nursing and is dependent on visual cues to assess the client. Telenurses are expected to assess, diagnose, plan, implement, and evaluate their patients through verbal communication only and they are expected to accomplish this task in a matter of several minutes. The challenges for telenurses are to

practice good interviewing skills, build trust over the telephone, and document the encounter during the call.

Communication is a key element in the majority of baccalaureate nursing programs and is a critical component in implementing the nursing process. In order to determine a nursing diagnosis appropriate for a particular client's symptom-related health care needs, the nurse must first accomplish a thorough assessment. The assessment involves a comprehensive history related to the client's specific health care problem. The symptom-related history is an account of the events immediately preceding, during, and after an episode of the symptom. During a face-to-face interaction of taking a history, the nurse is able to see the emphasis the patient puts on his or her symptom; however, this nonverbal communication is lost during a telenursing triage interaction.

Excellent communication in the health care field should be client-centered; clients should be involved in their own care; and clients should have a sense of control over their own treatment (Stewart & Roter, 1989). Their writings reveal a conviction, based on two decades of research, that better communication will give clients an increased sense of control over their problems and symptoms and over their own care. There is also the conviction that active client involvement in care will lead to earlier recovery and higher quality of life.

The definition of excellent communication provided by Stewart and Roter can also be applied to the nursing discipline. Communication between nurse and client has been extensively researched and written about over the past 30 years. Research

interest has focused on many issues relating to nurse-client communication, such as its lack of quality (Katz, 1984; Lyall, 1990), health professionals' concerns over what clients should be told and who should tell them (Laurent, 1991; Speck, 1991), and changes in communication skill as learners progress through their nurse training (Lubbers & Roy, 1990). The majority of studies investigated only the nurse during nurse-client interactions.

Other research studies have focused on certain client groups identified as having particular communication needs, for example, clients with cancer and elderly clients. A review of 21 articles concerning the role of communication in nursing care for elderly people indicated an increase over the past ten years in observation studies into nurse-client communication (Caris-Verhallen et al., 1997); however, all the studies that met the inclusion criteria were included in the review, regardless of their quality (reliability and validity) and sample size.

The findings indicate that the quality of nurse-client interaction is in question. The studies found that communications styles are inappropriate, level of communication is poor, more nurses use blocking rather than facilitating in communication, and that nurses exert power in communicating with their clients (Hewison, 1995; Waters, 1994; Wilkinson, 1991). It appears that although research concerning nurse-client communication is increasing, change has been minute in practice. Further, client surveys show that dissatisfaction, if it exists, is usually directed at poor communication (Davis & Fallowfield, 1991).

Good communication is a vital element in the delivery of quality telenursing triage care. A research study surveyed 132 hospital nurses to determine their communication education while in school, the availability of continuing education programs related to communication, and the most important communication skills in nursing (Lubbers & Roy, 1990). A modified version of the Communication Activities Questionnaire was used and a pilot study was conducted to assess reliability. Approximately 50% of vocational, associate, and diploma nurses received communication education; whereas, 90% of baccalaureate nurses received communication education. Of those who received communication education the largest percentage graduated between 1970-1985. The availability of continuing education programs related to communication offered in the nurses' present employment indicated 55% received very little or no in-service, 40% received some education, and only 5% received extensive in-service education in communication.

Symptom and Symptom Dimensions

A symptom is usually considered to be an abnormal sensation perceived by the client and is not observable (DeGowin, 2000). A study (Schwartz et al., 2000) at a Veteran Affairs Medical Center investigated types of calls ($n = 847$) received by the telenurse and it was found that 21% of the calls were symptom-related. The highest number of symptom-related calls ($n = 177$) was respiratory-related (27.4%) and the lowest number of symptom-related calls was bites and stings. It is interesting to note that 12.1% of the sample ($N = 847$) were mental health-related calls. In a study by

Delichatsios et al. (1998), the most frequent symptom-related calls were placed into a respiratory category (17%) and the least amount of symptom-related calls (1%) were categorized as anxiety. Sample size was adequate in both studies ($n = 177$; $n = 180$ respectively).

The eight symptom dimensions are identified during the assessment portion of the nursing process. The purpose of the telenursing triage assessment is to collect a health history of the present illness, which includes seeking information about symptoms and is accomplished by determining the following: (1) onset – date and time, gradual or sudden, precipitating and predisposing factors; (2) location and radiation; (3) duration of symptom; (4) character – quality, quantity, consistency; (5) aggravating/associated factors – body or respiratory movement; (6) relieving factors; (7) temporal factors – daytime/nighttime, seasonal, constant, intermittent, remissions, associated symptoms; and (8) severity of symptom – intensity, interference with normal activity or use of 0 – 10 pain scale (Seidel, Ball, Dains, & Benedict, 1999).

The American Academy of Ambulatory Care Nursing published practice standards for telenursing triage in 1997. Standard IV describes the use of the nursing process in telenursing triage practice and defines assessment under the nursing process as “appropriately assessing, prioritizing, and implementing the triage process, and performing complex telephone interviewing.” (p. 17) Telenursing triage assessment is the gathering, verification, and communication of data about a client to establish a database. The data selected focus on the client’s health status and actual or potential nursing care

problems. Once the assessment is completed, the telenurse synthesizes and analyzes the collected data in order to provide the client with telenursing triage advice. Standard IV also discusses the existence of guidelines for documenting telenursing triage encounters, which are based on the nursing process – assessment, diagnosis, planning, implementation, and evaluation.

A study by Hoare et al. (1999) investigated documentation of the eight symptom dimensions to determine the most frequently documented assessment information for chief complaints. Of the 2,831 records reviewed, the most frequently documented characteristic (97%) was the accompanying symptom; $\leq 25\%$ contained information about duration of chief complaint or factors aggravating or precipitating the chief complaint. The findings indicate those nurses evaluated as having expert skills in interpersonal relations documented more information than nurses who were evaluated as being less skilled in this area.

Military Veteran (Client)

Military veterans are a unique client population. They have many of the same health care issues as clients in the private sector; but, they also have some social and health care issues that are different. The Veterans Health Study of 2,160 subjects, which screened for depression, post-traumatic stress disorder (PTSD), and alcohol-related disorder found that screening rates of depression and PTSD and rates of mental health treatment were considerably higher among VA outpatients than among similar subjects in primary care in the private sector (Hankin, Spiro, Miller, & Kazis, 1999).

Another portion of the study, investigated the association between social support and mental and physical health using longitudinal data. The findings indicate that those veterans who suffer adverse consequences of traumatic events experienced while in the military were not affected by social support, suggesting that stressors associated with combat had a long lasting effect on the health status of veterans (Ren, Skinner, Lee, & Kazis, 1999).

As mentioned previously, military veterans have unique issues and needs when it comes to health care. A search of CINAHL, Medline, and PsychInfo using key words military veterans, telenursing triage communication, and interpersonal communication did not yield studies in this area; however, in the study by Schwartz et al. (2000) it was noted that 12.1% of veteran calls were mental health-related. It would be interesting to find out what kind of role communication plays in the interactions of these individuals and health care personnel, especially in telenursing triage.

Telenurse Characteristics

Over the past few years, there have been several studies that investigated different telenurse characteristics including the following: perception of length of call, hourly work status, competency, decision-making skills, interpersonal skills, nursing specialty, and level of education. These telenurse characteristics, for the most part, have been investigated in descriptive and exploratory studies as they relate to decision-making skills and documentation. The review of literature did not yield any research studies that investigated the above-mentioned characteristics and quality of communication; however, there was one study, which investigated nursing specialty (critical care) and quality of

documentation (Reisinger, 1998.). The findings from Reisinger's study indicate critical care nurses document more information than other nurses, and from these findings, the researcher concluded critical care nurses also have better interpersonal skills.

Call Characteristics

Call characteristics, in this study, were length of call and time of day the call occurred. In previous studies, call characteristics consisted of length of call, day of the week, month of call, and type of call. In a Veteran Affairs telenursing triage descriptive study by Schwartz et al. (2000) the call characteristics investigated were type of call, number of calls, and frequency of symptom-related calls. The telenurse calls were separated into three types: clinical ($n = 847$), administrative ($n = 121$), and general calls ($n = 163$) and then each type of call was broken down into several categories. The majority of clinical calls were categorized under follow-up of patient care (30%). Fifty-eight percent of administrative calls were categorized as appointments and the general calls were categorized as directions and phone numbers (14.4%).

The frequency of symptom-related calls were investigated according to season and the calls were categorized as either summer or winter calls. The findings indicated the majority of calls occurred during the winter months and were respiratory-related. Several research studies have investigated types and frequency of calls (Dale, Crouch, & Lloyd, 1998; Delichatsios et al., 1998; Henry, Borchelt, Schreiner, & Muse, 1994; Lattimer et al., 1998; Stirewalt et al., 1982; Wachter et al., 1999).

Disposition of Call

Currently, there are no studies that have investigated quality of communication between telenurse and client and disposition of calls. Disposition of call has been defined in previous studies as emergency room, same-day appointment, future appointment, and call back (Hoare et al., 1999); clinic, emergency room, referral to primary provider (Schwartz et al., 2000); and telephone advice only, appointment next day, and emergency department now (Crane & Benjamin, 2000). For the purposes of this study, disposition of calls were emergency room, self-care, same-day appointment, urgent, and appointment within seven days.

A telemedicine study by Crane and Benjamin (2000) examined disposition of call (telephone advice only, appointment next day, emergency department now) and conducted a comparison analysis to determine if disposition of calls was comparable to studies by Baker, Schubert, Kirwan, Lenkauskas, and Spaeth (1999) and Poole, Schmitt, Carruth, Peterson-Smith and Slusarski (1993). The findings indicated disposition of calls were comparable and that the majority of calls were dispositioned as self-care followed by appointment next day.

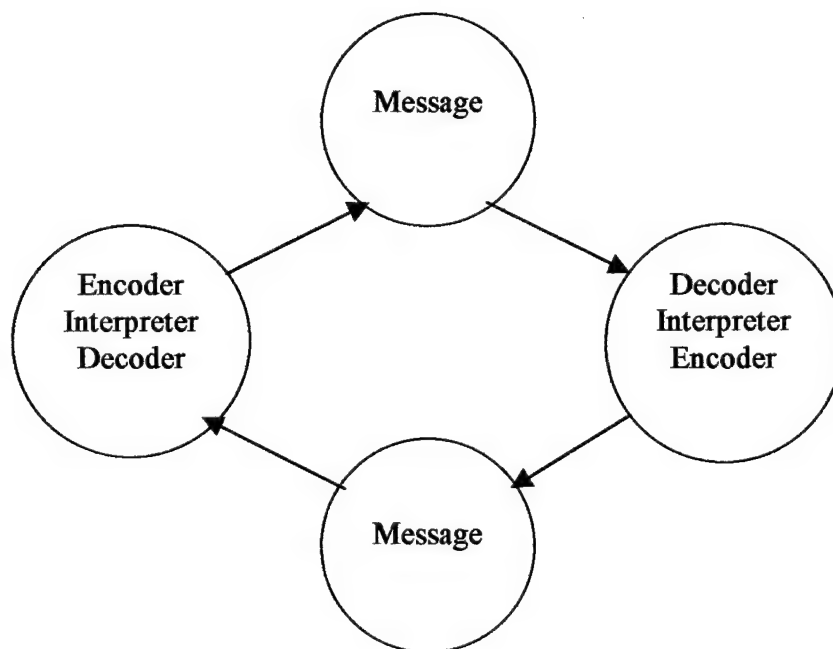
A telenursing study by Hoare et al. (1999) also investigated disposition of call (emergency department, self-care) and found that the primary disposition for the five chief complaints in the study was either referral to emergency department or self-care. The literature related to disposition of calls is limited in telenursing triage.

Conceptual Framework

The Schramm Communication Model

This retrospective, descriptive correlational study explored the interpersonal aspect of communication between telenurse and veteran. Schramm's (1954) third Communication Model served as a guideline. Schramm's third model defined communication as an interaction with both parties encoding, interpreting, decoding, transmitting, and receiving signals. In this model, feedback and the continuous loop of shared information appear, which are central components of nursing practice (Severin & Tankard, 1988, p. 35).

Figure 1. Schematic Presentation of Schramm's Communication Model.



Source: Severin & Tankard, 1988, p.35.

There is no one best way to analyze the communication process. A model of communication provides the telenurse with a framework for observing, understanding, and predicting what occurs as two people communicate. The sender transmits a message to the receiver, who responds by giving feedback and vice versa. The process is dynamic, with the meaning of messages mutually negotiated by the participants. As a person communicates, he or she may or may not be consciously aware of each element of communication. During casual conversation the participants do not bother to analyze the meaning of every word expressed; however, in communication where specific information is being sought, for example, a veteran seeking symptom-related health care information from a telenurse, both participants become conscious of each element of the communication process.

Nursing education curricula incorporates the communication process as a key component of nursing practice and teaches communication as a process involving a sender, message, receiver, and feedback (Potter & Perry, 2000). Nurses are taught the process of communication is an ongoing, dynamic, and reciprocal relationship and that each element of the communication process is crucial. If an element of the communication process is altered, information and meaning can be lost. By understanding each element and the factors influencing it, a nurse communicates with others more effectively. Nurses are also taught messages are conveyed in two primary modes: verbal and nonverbal.

Telenursing triage is an area of nursing practice that relies on verbal

communication only. To make a message clear and relevant, the nurse employs techniques of effective verbal communication: denotative and connotative meaning, vocabulary, pacing, intonation, clarity and brevity, and timing and relevance (Shuter, 1984). A single word can take on several meanings. A denotative meaning is one shared by individuals who use a common language. Connotations are shades or interpretations of a word's meaning rather than different definitions.

Another aspect of language that affects communication is vocabulary.

Communication is unsuccessful if the receiver is unable to translate the sender's words and phrases. In nursing, there is a vast vocabulary of technical terms that most lay people do not understand. If the telenurse uses many technical terms, the client may become confused and unable to follow instructions or learn important information. Pacing, the speed with which a message is verbalized, in addition to the presence, absence, and length of pauses, can determine the degree to which communication satisfies the listener.

Shuter (1984) also indicates intonation, clarity, brevity, and timing and relevance as critical to verbal communication, which is especially true for telenurses who have to totally depend on verbal communication. The tone of the nurse's voice can have a dramatic impact on the meaning of the message. For clarity and brevity, the message needs to be simple, short, and to the point. Clarity is achieved through speaking slowly and enunciating clearly. Timing is crucial to a person's reception of a message. If the information provided to the client is relevant to him or her, communication is more likely to occur.

A few studies in the communication discipline have addressed communication skills in the nursing profession. In a study by Hill (1978), four communication skills were listed as important to nurses: interdepartmental communication, listening, getting feedback, and interpersonal communication. A similar study (Morse & Piland, 1981), also investigated communication skills; nurses in this study identified the following as the most important communication skills: listening, information exchange, small group conference, instructing, and management of conflict. Finally, a study by Di Salvo, Larsen, and Backus (1986) investigated communication skills among health care professionals. The top six communication skills identified by nursing in this study were: listening, instructing, interviewing, motivating, advising, and giving feedback. Although the previously mentioned studies produced useful information, it is important to note that these studies occurred over 14 years ago and communication studies related to telephone nursing triage are nonexistent.

Communication education plays a significant role in how nurses interact with clients. A study by Lubbers and Roy (1990) investigated communication education of nurses while in school and during their nursing careers. The Communication Activities Questionnaire (CAQ) developed by Di Salvo et al. (1976) was used to collect specific information concerning communication training in school, training needed on the job, and communication problems faced on the job. Three hospitals participated in the research. Surveys ($n = 445$) were distributed to the nursing staff of the three hospitals; 132 questionnaires were returned for a 30% return rate. The findings indicated 90% of

baccalaureate nurses received communication education and that most of those (71%) graduated between the years 1970 – 1985. As for communication education in the nurses' present employment, 67% did not receive or received very little continuing education. Thirty-three percent received some or extensive continuing communication education.

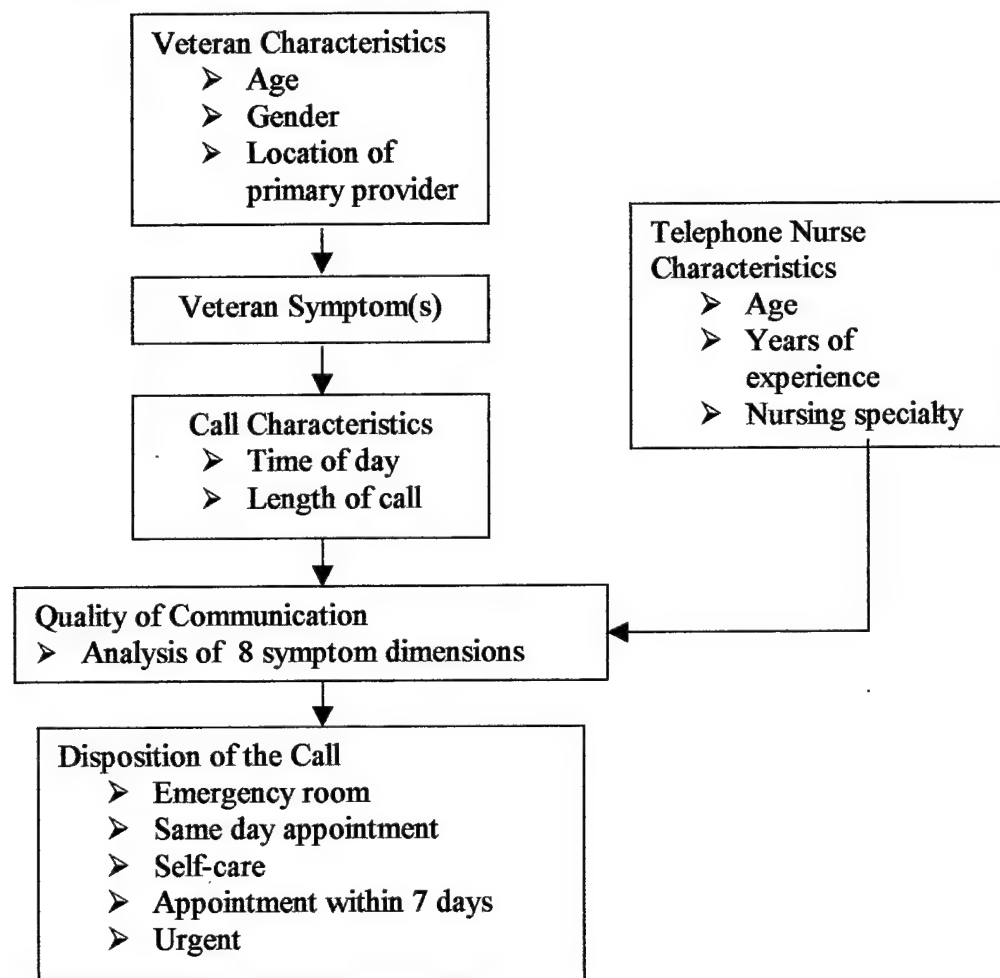
If communication skills are problematic for nurses related to lack of initial communication education and lack of continuing education, the assumption could be made that they are more problematic for telenurses who have to depend on verbal communication only. As of 1998, formal education for telephone triage did not exist as a unique specialty or as part of a general nursing curriculum (Reisinger, 1998).

Communication over the telephone changes the interactions with the client. The telenurse is use to visual cues in assessment because those skills are the basics of his or her education and experience in the clinical setting. The telenurse's senses are redirected to focus on the verbal communication skills of hearing and active listening, tone of voice, and inflections of speech as his or her only route to the client.

Schramm's (1954) Communication Model addresses communication as interaction with both parties encoding, interpreting, decoding, transmitting and receiving signals, resulting in feedback and a continuous loop of shared information (p. 35). The Telenurse Communication Model (Figure 2, p. 41) is the investigator's adapted version of Schramm's Communication Model. The veteran called to give symptom-related information and the telenurse decoded the information based on level of expertise. The telenurse communicated back to the veteran seeking information related to eight symptom dimensions – onset, location, duration, character, aggravating/associating

factors, relieving factors, temporal factors, and severity of symptom. The veteran decoded the information sent by the telenurse and encoded a response message. The telenurse then decoded information received, and determined health information and disposition of veteran. The veteran either accepted the advice provided ending the communication process or communication between veteran and telenurse continued until the veteran ended the call.

Figure 2. Telenursing Communication Model



Adaptation of Schramm's Communication Model.
Source: Severin & Tankard, 1988, p. 35.

The telenurse documented, via the computer, the communication exchange between telenurse and veteran as it occurred. The communication process was ongoing until both parties mutually agreed to terminate the call. The emphasis in telenursing triage is that of an expert communicator assisting clients in making their own health care decisions. Robinson et al., (1997) state:

the goal of the telenurse is to negotiate a mutually satisfactory solution to the problem, thus allowing the client to make his or her own health care decisions. Essential skills that enable the practitioner to accomplish these tasks are problem solving, negotiating, and expert communication skills. (p. 180).

Communicating effectively with the client in order to get the necessary information to provide appropriate advice becomes paramount to the telenurse.

As mentioned previously, communication between telenurse and veteran is critical to the nursing process. Telenurses use the history-taking (information seeking) mode of communication to obtain the veteran's health history of the present illness in order to collect data. It is important to note that telenurses are unable to perform a physical examination, thereby, losing the visual and tactile channels of communication. According to Perry and Potter (2000), there are many skills that promote effective communication; however, for telenurses who are trying to elicit specific information from the veteran – questions related to the topic or subject being discussed are the most effective. Questions and answers that address where, when, what, how, and why and that are documented indicate communication has taken place.

Assumptions

The primary assumption of Schramm's (1954) Communication Model is that communication between individuals will be perceived in the context that it is given. A definition of perception by Berelson (1952), states that perception is the "complex process by which people select, organize, and interpret sensory stimulation into a meaningful and coherent picture of the world" (p. 3). Perception is influenced by a number of psychological factors, including assumptions based on past experiences, cultural expectations, motivation (needs), moods, and attitudes.

The primary assumptions of the Telenurse Communication Model were:

1. Telenurses adhere to professionally defined criteria and standards of care.
2. Telenurses document the complete communication encounter in the telenursing notes.
3. Telenurses utilize the nursing process (assessment) to gather information from the veteran.
4. Veterans' descriptions of the symptom are truthful.

Summary

The conceptual framework from which this retrospective study was derived is Schramm's (1954) Communication Model (p. 35). The Telenursing Communication Model, an adapted version of Schramm's Communication Model, was utilized to guide the research process. The communication model focuses on the humanistic component of communication as an interaction with both parties encoding, interpreting, decoding, transmitting, and receiving signals. Quality nurse-client communication is integral to

nursing practice. For those nurses who practice telenursing, relying on verbal communication only, nurse-client communication is critical to ensure that the client's health care needs are addressed and met.

Three basic skills have been identified in the nursing literature as essential to telenursing: communication, easy access to health information resources, and documentation. Studies investigating telenursing triage communication and assessment of symptom dimensions are non-existent. Telenursing triage is a new nursing discipline, very different from bedside nursing on which most nurses base their experience. This area of nursing practice didn't exist when most nurses now staffing telenursing triage call centers attended nursing school. Clearly established education basics for this new discipline do not exist. If nursing is to move forward in health care and provide services to meet demand management, it is imperative to incorporate telenursing triage practice and the skills needed into nursing education curricula and training programs.

Health care is witnessing an explosion in demands for information from clients who want more information and greater opportunities to be active in their dealings with health care practitioners. Military veterans are no exception. Good nurse-client communication is essential in telenursing due to the fact that the nursing process must be accomplished without the aid of nonverbal communication. The failure of the communication discipline to have a major impact on nursing is, in part, because most research in health communication usually deals with the client-physician relationship (Street & Wiemann, 1987).

III: PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The purpose of this retrospective study was to examine the relationship between quality of communication in telenursing triage notes and selected veteran, call, and telenurse variables, symptom, and disposition of call. This study also examined the relationship between quality of communication and eight possible dimensions of a symptom – onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of the symptom. Understanding communication trends during the telenursing triage encounter may help with establishing computerized simulations and activities for learning in telenursing training programs and nursing education curricula. This investigation was implemented in a large, Midwestern Veteran Affairs Medical Center. This chapter discusses in depth the research design, setting, population, sampling plan, ethical considerations, instruments, procedures, and data analysis plan.

Research Design

The research design was a retrospective, descriptive correlational design using content analysis to examine selected variables in telenursing triage and to examine the relationship between quality of communication and veteran age, time of call, symptom, nurse's years of experience, and disposition of call. The investigation focused on paper

computerized records, which contained only symptom related telenursing triage calls, occurring between March 1, 2001 and June 30, 2001. The information collected was coded, categorized, and compared using a data collection tool developed by the investigator.

Setting

The setting was a telenursing triage call center in a large, JCAHO accredited, Veteran Affairs Medical Center located in a midwestern metropolitan area with a population of approximately 650,000. The setting was chosen for its accessibility and large population for adequate sample size.

Sampling Plan

The population from which the study sample was drawn ($n = 100$) consisted of computerized paper copies of telenursing triage notes. The sample selected was symptom-related calls from veterans during the period of March 1, 2001 through June 30, 2001. Telenursing triage calls classified as "symptom-related" were randomly sampled in order to (a) select 100 computerized paper copies of the telenursing notes, (b) provide representativeness of the population, (c) collect data that may assist in developing curricula for training and education, and (d) provide information for quality improvement. The sample plan for this study was probability sampling to ensure that every element of the population had a probability higher than zero of being selected.

Sampling Method

The sampling method was stratification of the symptom-related telenursing triage calls because of the variable telenurse. The telenursing triage call center employed five

nurses at the beginning of this study and five telenursing notes per each nurse were selected for the months of March, April, May, and June ($n = 100$) to achieve representativeness. Stratification ensured that all levels of the identified independent variable were adequately represented in the sample and also allowed the investigator to use a smaller sample size (Burns & Groves, 1997).

Procedures

First, the researcher determined if the telenursing note met the inclusion and exclusion criteria. Inclusion criteria are listed as follows:

1. Telenursing calls that are symptom related.
2. Veteran is eligible for VA health care benefits.
3. Veteran meets location of primary provider criteria for health care from the telenursing triage call center in the study.

Exclusion criteria are listed as follows:

1. Telenursing triage documentation indicating inability to understand the client's speech/language.
2. Clients classified as anonymous caller.

After the population was randomly selected the investigator collected and input the data into an Excel spreadsheet designed by the investigator and approved by a statistician located at the university's statistical consulting center. The transfer of data occurred at the Veteran Affairs Medical Center onto the data collection sheet. All variables, to include veteran and telenurse, were assigned codes prior to input onto the data collection sheet in order to provide confidentiality.

The investigator maintained a separate list, which contained the assigned code, the veterans' first initial of the last name, the last four numbers of the social security number, and the date, time, and location of the primary provider. The telenurses' first initial in the first name was also transcribed onto the same list along with the assigned code. The list was maintained in a locked file cabinet in the office of Charlene Marbury, Program Director for the VA Telenurse Call Center. The investigator followed all rules related to client confidentiality by not discussing client information located on the computerized paper copies of the medical record.

Delimitations

By limiting the selected study population to telenursing triage encounters in a VAMC setting and using a descriptive correlational design, this retrospective study limited the possibility of telenursing triage encounter differences and/or associations from being related to differences and/or associations in telenursing triage encounters in other telenursing call centers. This study does not confirm any of the findings but hopefully will encourage more rigorously designed studies with larger samples.

Size and How Size Selected

A statistician from the university's statistical consulting center reviewed the proposal, and, based on the number of variables and questions, determined that a sample size of 100 telenursing triage notes was necessary for the investigation.

Ethical Considerations

Assigning a code number to each nurse and veteran involved in a telenursing encounter promoted confidentiality of the subjects. The investigator did not share

information located in the medical records or data forms, which ensured confidentiality.

All notes and data will be destroyed at the completion of the study.

Instrument

Data collected from the telenursing triage notes ($n = 100$) eligible for this study include veteran characteristics (age, gender, location of primary provider), symptom, call characteristics (time of day, length of call), telenurse characteristics (age, years of experience, nursing specialty), eight symptom dimensions and disposition of call (see Appendix A). The disposition of call refers to emergency room, same-day appointment, appointment within seven days, self-care, and urgent. The eight symptom dimensions were defined as onset, location, duration, character, aggravating/alleviating factors, relieving factors, temporal factors, and severity of symptom. Definitions of each symptom dimension are provided to ensure appropriate categorization of data (See Appendix A).

Data collected from the telenursing triage notes relating to the eight predetermined symptom dimensions was based on the methodology content analysis. Content analysis is a systematic, step-by-step process that allows analyzing message content of certain communicators. There are two types of categories used to classify units in content analysis: substance, the content of the message; and form, the way it is said. This study used substance to classify the data.

The investigator evaluated the telenursing triage note first by using content analysis to determine if the note contained words that could be placed into the eight

predetermined symptom dimension categories. Quality of communication was determined from the number of symptom dimension categories the telenurse addressed during the nurse-veteran interaction. A five-point Likert Scale was used to measure quality of communication and included the following scores: 4 = excellent, 3 = above average, 2 = average, 1 = below average, and 0 = extremely poor. Instructions related to the five-point scale ensured appropriate scoring of each symptom dimension category (See Appendix A.)

Standardization

The data collection instrument incorporated one of the standard ways, from the literature, in which communication is measured. There are five content analysis techniques used to collect data and are listed as follows:

1. Text selection and sampling. The investigator selected the text, from the telenursing triage notes, appropriate to the research question – What is the relationship between analysis of quality of communication and veteran age, time of day, nurse's years of experience, symptom, and disposition of call?
2. Determining the unit of analysis. The investigator coded messages embedded in the telenursing triage notes according to the eight symptom dimension categories.
3. Developing and defining content categories. The investigator identified the unit as substance (content of the message) in the telenursing triage note. The eight symptom dimension categories were predetermined prior to implementation of the study and are derived from the assessment phase of the nursing process.

4. Coding units. The investigator coded the units. Krippendorff (1980) recommends at least two coders or more to classify each unit into its appropriate category. The investigator was unable to do this related to the requirements set forth by the College of Nursing and Health; however, two external reviewers accomplished an audit of 10 telenursing triage notes. The results are discussed under reliability.
5. Analyzing the data. The eight symptom dimension categories were each assigned a number (1-8) and are nominal categories yielding qualitative data. Counting the number of units (1-8) yields quantitative data. Both types of data were useful for describing, understanding, and critiquing the content of the communication being studied.

Reliability

There are two forms of reliability that are important to consider when using content analysis, stability over time and reproducibility. To enhance stability, the investigator developed precise rules for coding and ensured accuracy in the process of coding and transcribing data. The rules are listed as follows:

1. Each data collection sheet is assigned a number.
2. The investigator follows the layout of the data collection to input numerical data and words.
3. Instructions for completing the eight symptom dimension categories are followed.
4. All data collection sheets are completed prior to assigning categories for symptoms.
5. The symptom words are assigned numerical codes.

6. Data collected were assigned numerical codes and input into an Excel spreadsheet under the guidance of the Statistical Consulting Center.

Reproducibility was addressed by having two experienced, graduate-prepared nurses apply the same recording instructions independently to the set of data. Reliability, in content analysis, is estimated through computing the percent of time two independent coders agree when they each code the same material. At least a 90% agreement should be reached for a one- or two-digit code before it is considered sufficiently reliable for use in research; however a more realistic expectation is 85%, since the possibility for disagreement exists at any level of the code (Fox, 1982).

Since there was only one coder involved in collecting data, this was a limitation. Instead of inter-coder reliability, the investigator used the strategies auditability and interpretive reliability. Auditability requires that the researcher establish decision rules for categorizing data, arriving at ratings, or making judgments (Burns & Grove, 1997). Defining each category of the eight symptom dimensions in detail and defining the scoring system for quality of communication as all-inclusive with explicit directions accomplished auditability (See Appendix B).

Interpretive reliability assessed the extent to which each judge assigned the same category to a given unit of data. The investigator addressed interpretative reliability by having two graduate-prepared nurses evaluate 10 telenursing triage notes. The criteria for the graduate-prepared nurses were as follows: (a) extensive clinical background in

utilizing the nursing process, specifically assessment and symptom analysis, (b) experience in adult assessment, and (c) experience in research rigor in qualitative analysis.

Each graduate-prepared nurse was provided with a copy of the first ten telenursing triage notes from the sample, ten copies of the portion of the tool related to the eight symptom dimension categories, directions on how to complete the data collection tool, and definitions for the eight symptom dimensions.

Validity

Validity occurs if the researcher's instrument measures the abstract concept – communication. In this study, validity evidence was obtained from the literature and two doctorate-prepared communication experts. The investigator accomplished an extensive literature review of communication and content analysis prior to implementing the study. Two doctorate-prepared communication experts reviewed the researcher-designed instrument and agreed it measures communication.

The investigator was unable to determine construct validity because it takes several years of scientific work to determine validity. It is important to note that with content analysis, it is the validity of the classification system, variables derived from it, and the interpretation arising from the data that are important. In other words, to say that a category or variable is valid infers that there is a relationship between the concept being investigated and the category emerging from the data.

Scoring

Scoring of communication was accomplished using a five-point Likert scale (See Appendix A).

Summary

Communication skills are an essential component of telenursing triage. This study was a retrospective, descriptive correlational study investigating the content and context of telenursing triage notes in a Veteran Affairs Medical Center. The sample was randomly selected using stratification. Content analysis was used to code, categorize and compare the content variables of the telenursing triage notes in order to evaluate the quality of communication. Demographic data was also collected and analyzed along with quality of communication to determine frequencies and possible relationships among the variables.

Issues concerning reliability and validity of the researcher-designed tool were addressed and strategies to increase the reliability and validity of the instrument were discussed. The multiple regression analysis predicted and explained as much of the variance in the values of quality of communication as possible. The analysis in this study was exploratory and the focus was prediction to determine which variables impact quality of communication.

IV. ANALYSIS OF DATA

It is known that face-to-face communication is problematic between health care providers and clients. Telenursing triage usually incorporates training in the use of protocols and/or use of telecommunication equipment. Little is known about telenursing and the quality of communication between telenurse and client as it relates to eight symptom dimensions. This chapter discusses the results of reliability and validity measures of the investigator-designed instrument, describes the analysis of demographic data, and discusses the analysis of quality of communication using the Content Analysis of Quality of Communication and Selected Variables Tool (See Appendix A). Totaling the number of symptom dimensions addressed in the telenursing triage note and assigning a score based on a five point Likert scale determined quality of communication. Each research question will be presented and discussed.

Investigator Designed Instrument

The Content Analysis of Quality of Communication and Selected Variables Tool was designed by the investigator based on variables of interest as guided by the Telenursing Communication Model. Two graduate-prepared nurses conducted an audit of the first 10 telenursing triage notes from the sample ($n = 100$) for comparison with the investigator's audit. One symptom dimension from one telenursing triage note audited by one of the graduate-prepared nurses contained a different evaluation than the

investigator's audit of the same telenursing triage note. The two graduate-prepared nurses applied the same recording instructions independently to the set of data. The percentage of agreement was 93% between the two external reviewers and the investigator, which accomplished reproducibility reliability. (An agreement of at least 90% should be reached for a one- or two-digit code.)

Stability, as a form of reliability for the instrument, was also addressed. Precise rules for coding and transcribing data were accomplished (see p. 49). Auditability was accomplished through the establishment of decision rules for categorizing data and arriving at ratings (See Appendix A). The two graduate-prepared nurses ensured interpretive reliability by assigning the same words in the telenursing triage notes to the eight symptom dimensions. (Cohen's Kappa is the statistical analysis most often used to determine interpretive reliability; however, it was not part of the data analysis plan. The investigator did discuss the results of the audit with a statistical consultant and since there was only one word that differed in one symptom dimension category between the auditors, it was determined that a statistical analysis was not necessary.)

Validity occurs if the investigator's instrument measures the concept communication. Unfortunately, no instrument was found that investigated telenursing triage interaction between nurse and client. It takes years of scientific research to refine an instrument to the point that it has construct validity. For the purpose of this study, validity of the investigator's instrument was determined by using content analysis. To say that a category or variable is valid infers that there is a relationship between the concepts

being investigated and the category emerging from the data. Statistical analyses in this study indicates that the concept communication was measured. A significant relationship between quality of communication, nurse's years of experience, and disposition of call was established.

Description of Sample

The sample in this study ($N = 93$) consisted of computerized paper copies of telenursing triage calls, which occurred between March 1, 2001 and June 30, 2001. The effective sample size was ($N = 93$) related to seven records contained only the age, years of experience, and nursing specialty of the nurse who took the call. Because of the missing values, only 93 observations could be used in the analysis. The level of significance for all inferences made in this study is $\alpha = .05$. The first five research questions contained demographic variables and will be described using descriptive statistics – frequency distributions, measures of central tendency and dispersion. Multiple regression analysis was used to answer the sixth research question related to the number of independent variables in the study.

Demographics

What are veteran characteristics (age, gender, and location of primary provider) of those veterans utilizing the telenursing triage call center?

The age of the veterans who called into the VAMC telenursing triage call center ranged from 23 years through 90 years ($M = 53.3$ years, $SD = 21.05$). The largest number of veteran calls occurred in the age group 41 – 60 years ($n = 42$). The age group 81 – 100

had the least number calls ($n = 5$). Figure 3 indicates the number of calls per age group of veterans calling the VAMC telenursing triage call center. Seven of the telenursing triage notes did not indicate the age of the client (frequency missing = 7).

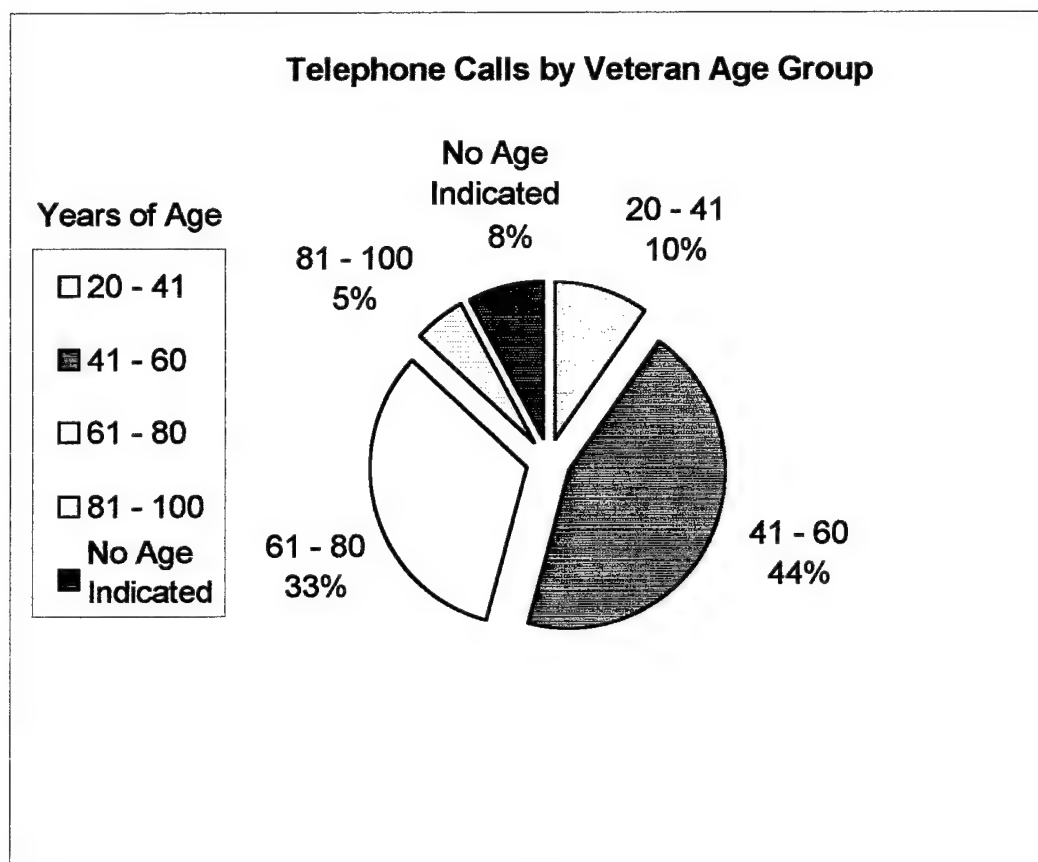


Figure 3. Percentage of veteran symptom related telephone calls, by age group, to the VAMC telenursing call center.

Sixty-seven percent of the callers were male; 25% were female; and no information was indicated for the remaining eight percent. Location of primary provider was the third veteran characteristics variable and of the five locations selected for the study most calls ($n = 35$) came from veterans assigned to Dayton and the least amount of calls ($n = 4$) came from veterans assigned to Cleveland (See Table 1, p. 59).

Table 1.

Veteran Characteristic - Location of Primary Provider

Location	Frequency	Percent
Dayton	35	37.6
Cleveland	4	4.3
Columbus	15	16.1
Chillicothe	14	15.1
Cincinnati	25 (N = 93)	26.9

* Frequency missing = 7.

Table 2 represents two variables that were addressed in the analysis, but were not statistically significant.

Table 2.

Miscellaneous Demographic Data

Variable	Frequency	Percent
Client the Caller		
Yes	64	68.8
No	29	31.2
	(N = 93)	
Gender of Caller		
Male	62	66.7
Female	23	24.7
No information	8	8.6
	(N = 93)	

* Frequency missing = 7

What are the call characteristics, time of day and length of call, of veteran calls placed to the telenursing triage call center?

The time of day is presented as a dichotomous variable. The calls were placed into two categories – morning (0001 – 1200) and evening (1201 – 2400). The length of veteran call was not provided on the hard copies of the telenursing triage notes and was not included in the analysis; however, the VAMC's information specialist provided information based on their analysis of length of call from March 1, 2001 through June 30, 2001 ($M = 7.53$ minutes).

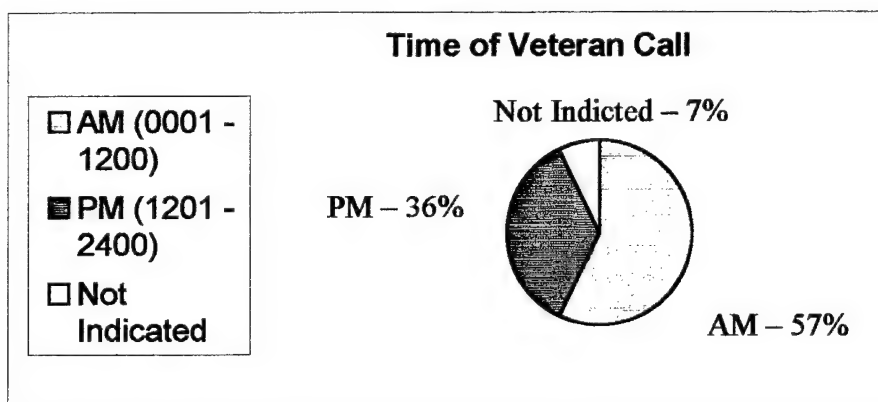


Figure 4. Indicates the percentage of veteran calls and their occurrence to the VAMC telenursing triage call center.

What are the characteristics (age, years of experience, and nursing specialty) of the telenurses providing symptom-related health care advice to veterans?

Five telenurses were employed by the VAMC at the beginning of the study. The telenurses involved in the study have a considerable number of years of nursing experience ($M = 20.6$). The age range of the five telenurses is 40 – 58 years of age

($M = 49.2$). Two areas of nursing specialty were identified between the five telenurses – critical care ($n = 3$) and medical-surgical nursing ($n = 2$).

What are the veteran dispositions (emergency room, same day appointment, self-care, appointment within seven days, and urgent) of telenursing triage calls?

The veteran called the VAMC telenursing triage call center seeking symptom-related health care advice. The information gained by the telenurse from the veteran during the telenursing call assisted the telenurse in determining the appropriate disposition of the veteran. The majority of veterans were dispositioned to the emergency room ($n = 39$) and the smallest number of veteran calls ($n = 6$) was dispositioned to urgent care. The five disposition characteristics and frequency of distribution are listed in Figure 3, p. 62.

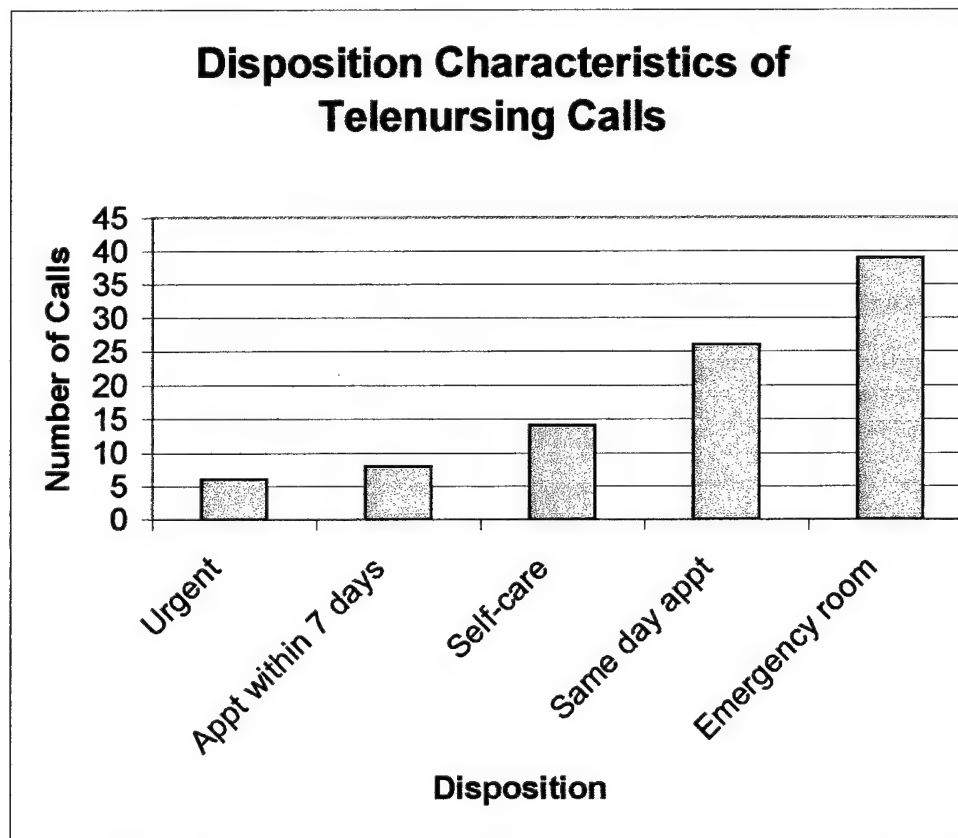


Figure 5. Frequency of veteran symptom related calls to the telenursing call center and level of disposition. *Frequency missing = 7.

What are the most frequently reported symptoms by veterans to the telenurse?

Content analysis was used to code and categorize the veteran-reported symptoms to the telenurse. Because of the numerous variables in the study, a pain category was established and all pain related symptoms reported by veterans were placed into this category. The veteran-reported pain symptoms occurred in the following anatomical locations: chest, testicular, neck, head, abdominal, ear, back, ankle, eye, and leg.

Symptom-related calls described as depression, suicidal, anxiety, and paranoia was placed in the psychiatric category. All other symptom-related calls were placed into a category classified as other which included the following veteran-reported symptoms: weakness/fatigue, confusion/restlessness, sleeplessness, dizziness, shortness of breath, chills/fever, lower extremity swelling, and hyperglycemia. The following table depicts the frequency of symptoms per category.

Table 3.

Classification and Frequency of Symptom Related Calls

Variable	Frequency	Percent
Pain	26	28.0
Cough	5	5.4
Rash/Itching	5	5.4
Nausea/Vomiting	4	4.3
Psychiatric	5	5.4
Diarrhea/Rectal Bleeding	9	9.7
Other	39 (N = 93)	41.9

* Frequency missing = 7

What is the relationship between analysis of quality of communication and veteran age, time of call, symptom, nurse's years of experience and disposition of call?

As mentioned previously, this retrospective study was a descriptive correlational study. Multiple regression analysis was used to explore the variables and to predict the

values of the dependent variable – quality of communication. Quality of communication was based on eight symptom dimensions and is listed as follows: onset, location, duration, character, aggravating/associating factors, relieving factors, temporal factors, and severity of symptoms.

Table 4 depicts the eight symptom dimensions and communication.. The answer *yes* below each symptom dimension indicates the dimension was addressed by the telenurse and the answer *no* indicates it was not addressed. The most frequently addressed symptom dimension was duration ($n = 75$) and the least frequently addressed symptom dimension was relieving factors ($n = 70$).

Table 4.

Symptom Dimensions and Communication

(N = 93)		
Variable	Frequency	Percent
Onset		
Yes	54	58.1
No	39	41.9
Location		
Yes	71	76.3
No	22	23.7
Duration		
Yes	75	80.6
No	18	19.4
Character		
Yes	23	24.7
No	70	75.3

Table 4 (continued)

(N = 93)		
Variable	Frequency	Percent
Aggravating/Associating Factors		
Yes	27	29.0
No	66	71.0
Relieving Factors		
Yes	17	18.3
No	76	81.7
Temporal Factors		
Yes	56	60.2
No	37	39.8
Severity of Symptoms		
Yes	19	20.4
No	74	79.6

* Frequency missing = 7

Measures of central tendency (M) determined that the age of the telenurses, years of experience, and quality of communication score were evenly distributed and are listed in the following table. The dependent variable, quality of communication, was measured using a five point Likert Scale, which ranged from 0 - extremely poor communication through 4 - excellent communication (See Appendix A). The age of the telenurses ($M = 49.0$, $SD = 33.26$) who demonstrated a quality of communication score of 4 (excellent) are about the same as age of the telenurses ($M = 49.72$, $SD = 11.85$) who scored 0 (extremely poor). As to telenurses' years of experience, those who scored excellent in quality of communication ($M = 27.75$, $SD = 4.5$) have an average of ten years more nursing experience than those who scored extremely poor in quality of communication

($M = 17.85$, $SD = 1.46$). An analysis of quality of communication score was based on the number of symptom dimensions addressed during the telenurse and veteran interaction.

Table 5.

Distribution of Telenurses' Demographic Variables and Quality of Communication Score

Level of Score	<i>n</i>	Telenurse Age		Years of Experience	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Excellent	4	49.0	33.26	27.75	4.50
Above Average	23	55.65	22.03	20.13	4.25
Average	47	55.53	19.32	21.08	5.44
Below Average	12	43.75	25.48	20.16	4.80
Extremely Poor	7 (<i>N</i> = 93)	49.71	11.85	17.85	1.46

* Frequency missing = 7

The formula $10\% < R^2 < 25\%$, based on previous nursing studies, determines the strength of the regression. If the strength of the regression is between 10 – 25%, it is considered moderate-strength regression. The strength of regression for this study was 23%.

A multiple regression analysis was conducted to determine if any of the independent variables significantly influenced the quality of communication score. All independent variables were put into the regression model at the same time. Communication scores were entered into the regression model as the dependent variable. The initial statistical analysis determined that there was at least one predictor, which significantly influenced quality of communication scores ($R^2 = 0.2325$, $p = 0.0034$).

Table 6 depicts the relationship between selected variables and quality of communication score.

Table 6.

Relationships Among Selected Variables and Quality of Communication Score

Variable	df	Estimated Regression Co-efficient	Standard Error	t value	pr > t
Veteran Age	1	0.005	0.004	1.16	0.248
Time of Call	1	-0.370	0.197	-1.88	0.064
Years of Nursing Experience	1	0.051	0.019	2.73	0.008
Level of Disposition (Compared to Emergency Room)					
Same Day Appt	1	0.614	0.219	-2.81	0.006
Self-care	1	-0.720	0.273	-2.64	0.010
Other Disposition	1	-0.832	0.269	-3.09	0.003
Symptoms (Compared to Pain)					
Physical	1	-0.224	0.248	-0.90	0.369
Other Symptoms	1	-0.034	0.217	-0.16	0.877

*Frequency missing = 7.

The relationship between the demographic variables veteran age, time of day, and years of nursing experience is addressed first. A positive relationship was found to exist between years of nursing experience and quality of communication score ($p = 0.008$) and is statistically significant. There was no statistically significant relationship between

veteran age ($p = 0.248$) and quality of communication score. There was no statistically significant relationship between time of day (a.m., p.m.) and quality of communication ($p = 0.064$); however, the result was close to significance at the 5% level.

Three categories were used for the independent variable symptom: pain, physical, and other and there was no statistically significant relationship between symptom ($p > 0.35$) and quality of communication score. Three categories were also used for the independent variable disposition of call: same-day appointment, self-care, and other. There was a statistically significant relationship between disposition of call and quality of communication score ($p = 0.006$, $p = 0.010$, $p = 0.003$ respectively). The same-day appointment, self-care, urgent, and appointment within seven days variables each had lower average of quality of communication scores ($p \leq 0.01$). The relationship between quality of communication and emergency room disposition also indicated a statistically significant relationship ($p = 0.028$).

Summary

This chapter presented veteran and telenurse demographic data and an analysis of the data collected using the Content Analysis of Quality of Communication and Selected Variables Instrument designed by the investigator.

The first research question, "What are veteran characteristics (age, gender, and location of primary provider) of those veterans utilizing the telenursing triage call center?" was answered using descriptive statistics. Measures of central tendency were used to analyze veteran age. Mean age and standard deviation were outlined. The

variables gender and location of primary provider were analyzed using frequency distributions.

The second research question, "What are the call characteristics, time of day and length of call, of veteran calls placed to the telenursing triage call center?" was answered using descriptive statistics. The time of day variable was presented as a dichotomous variable. Fisher's Exact Test and Chi-square test were used to determine if there was a relationship between time of call and quality of communication score. Length of call was not included in this data analysis because it was not available on the hard copies of the telenursing triage notes; however, an information specialist from the VAMC provided the data for this study.

The third research question, "What are the characteristics (age, years of experience, and nursing specialty) of the telenurses providing symptom-related health care advice to veterans?" was answered using descriptive statistics. Measures of central tendency were used to measure age and years of experience, and frequency distributions were used to measure nursing specialty.

The fourth research question, "What are the veteran dispositions (emergency room, same day appointment, self-care, appointment with seven days, and urgent) of telenurse calls?" was answered using frequency distributions.

The fifth research question, "What are the most frequently reported symptoms by veterans to the telenurse?" was answered using frequency distributions.

The final research question, "What is the relationship between analysis of quality of communication and veteran age, time of call, nurse's years of experience and

disposition of call?” was answered using multiple regression analysis to predict the value of the dependent variable – quality of communication. Telenurses’ communication scores were significantly lower with all dispositions of call categories except for emergency room dispositions.

V. DISCUSSION

A discussion of the research study is presented in this chapter. Conclusions, limitations and implications are discussed, along with recommendations for future research.

Summary

Telenursing triage is a nursing subspecialty that is expanding. Telenursing triage call centers are springing up as a support system for health care organizations by providing client education, primary care advice, health counseling, utilization control, customer satisfaction, and true triage. The challenges for new telenurse are based on the telephone being a new vehicle for providing nursing practice. The telephone presents the nurse with the challenge of having only verbal communication with the patient. Good communication and the ability to build trust over the telephone are essential skills the telenurse needs to refine.

Prior literature (Nauright et al., 1999; Barton, Brown, Curtis, & Lichtenfeld, 1992; Hoare et al., 1999; Lubbers & Roy, 1990; DeVore, 1999) has suggested several nursing goals to increase the quality of communication during the telenurse-client interaction. However, valid and reliable data have not been available to substantiate the goals.

This study was conducted in a telenursing triage call center, at a Veteran Affairs Medical Center, located in a midwestern metropolitan city. A retrospective audit of 100 telenursing triage notes was accomplished using the Content Analysis of Quality of Communication and Selected Variables Tool designed by the investigator. The information gained from this study will be provided to the Telenursing Program Director for quality improvement purposes.

Conclusions

Based on the findings of this study, communication between telenurse and veteran is problematic.

Discussion

Quality of Communication

The results of this study indicate the need for telenursing communication in nursing curricula. Even though 79% of the telenursing triage notes met the criteria for a quality of communication score of average or above, meaning the telenurse addressed a minimum of four out of the eight symptom dimensions, quality of communication is questionable. The findings of this retrospective study are presented and discussed per research question.

1. What are the veteran characteristics (age, gender, and location of primary provider) of veterans who use the telenursing triage call center?

The veteran characteristics were demographic data and were not statistically significant. In this study, veterans between 41 –60 years of age made the majority of calls (44%). In the study by Lattimer et al. (1998) the majority of calls (37%) also occurred in

this age range. Females appear to call into telenursing triage centers more often than males (Delichatsios et al., 1998; Lattimer et al., 1998); however, the veteran population consists of mostly males and was not the case in this study. Further research using a veteran sample warrants stratification of the sample by gender to ensure representativeness of the sample.

Location of primary provider also was not statistically significant; however, only five locations in one state, out of numerous locations in this particular state and in several other states, were included. Veterans assigned to the Dayton location, which is where the telenursing triage call center is located, had the largest percentage of calls. The increased number of calls could be related to increased advertisement at the local facility and veteran familiarity with the system. The increased number of calls could also be related to the fact that the program's initial start-up was at the Dayton VAMC and has branched out over the past several years to other states.

2. What are the call characteristics (time of day and length of call) of veteran calls placed to the telenursing triage call center?

Length of call and time of day were not statistically significant. The length of call in previous studies (Dale & Crouch, 1998; Stirewalt et al., 1982) were seven minutes and in this study the average length of call was 8 minutes. The literature reviewed did not indicate time of day as a call characteristic; however, in this study since time of day was close to significance at the 0.05 level ($p = 0.0639$), a chi square test was accomplished to analyze the differences between communication score and time of day. The analysis

indicated that the quality of communication increased during the AM hours (0001 – 1200) with communication scores in the above average and excellent categories. The PM hours (1201 – 2400) indicate that quality of communication decreased with scores in the below average and extremely poor communications. Although the analysis was not statistically significant, further research is suggested.

What are the characteristics (age, years of experience, and nursing specialty) of the telenurses providing symptom-related advice to veterans?

The telenurse's age and nursing specialty were not statistically significant in this study. The literature reviewed did not indicate telenurse age as a variable; however, Reisinger (1998) addressed nursing specialty as a variable in her study, which investigated experiences of critical care nurses and medical-surgical nurses in telenursing triage positions. The telenurses disclosed information indicating previous experience in critical care allowed them to adjust to the practice of telenursing triage easier and to take more calls per hour than the medical-surgical nurses. The author goes on to say that the critical care nurses cited having only verbal communication presented a challenge and that they had to redirect their senses to focus on the verbal communication skills of hearing and active listening, tone of voice, and inflections of speech as his or her only route to the patient.

The study by Schwartz et al. (2000) indicated that the Bronx VA Medical Center staffs their telenursing triage center solely with advanced practice nurses and critical care nurses. The reason cited is because of their ability to work independently and make critical judgments. It is interesting to note that the authors also indicate their telenurses

have exceptional interpersonal and telephone skills, yet, they do not disclose how they came to this conclusion. The third telenurse characteristic was years of experience, which had a direct relationship with quality of communication. Years of experience will be discussed under research question six.

3. What is the disposition (emergency room, same-day appointment, self-care, appointment within seven days, and urgent) of telenursing triage calls?

The majority of the veterans calling the telenursing triage calls were dispositioned to the emergency room (42%) and same-day appointment (28%). Disposition of call was statistically significant and will be discussed more under research question six. The primary disposition of call, in the telenursing triage study by Hoare et al., (1999), indicated (44%) of the calls were referred to the emergency room and (44%) received advice for home or self care. In the telemedicine study by Crane and Benjamin (2000), nineteen percent of the clients received an emergency room disposition as opposed to (57%) receiving telephone advice only. There is an interesting contrast to these studies; the physician-ran triage services have a lower percentage of dispositions to the emergency room as opposed to the telenursing study, which have higher percentages of individuals dispositioned to the emergency room. The VAMC in this particular study is currently utilizing a computerized physician-reviewed triage software package.

5. What are the most frequently reported symptoms by veterans to the telenursing triage call center?

At the beginning of this study, the symptom words were collected as individual data. The categories were determined by the frequency of the symptom, which included

the following: pain, cough, rash/itching, nausea/vomiting, psychiatric, diarrhea/rectal bleeding and other. Because of the large number of variables in this study, the categories were input into a multiple regression analysis as three dummy variables labeled pain, physical, and other. The investigator believes that information may have been lost related to how the previous seven symptom categories were translated to the three dummy variable categories.

As mentioned previously, for this study pain was the most frequently reported symptom. Previous research studies support this finding (Dale & Crouch, 1998; Hoare et al., 1999; Schwartz et al., 2000); cough was found to be the second most frequently reported symptom in both studies. A limitation in this portion of the researcher's study is that the category classified as 'other' may cause confusion when interpreting the analysis. The 'other' category included a variety of symptom-related calls with frequencies of ≤ 3 . The second most frequently reported symptom was diarrhea/rectal bleeding; however, the way the symptoms were categorized it is difficult for the reader to interpret the data.

It must be acknowledged that considerable overlap can exist between categories, such as symptom-related health information and psychological support. Symptom categories are usually established by determining the overriding nature of the call, and are a subjective limitation to the audit, in that the category is based on the rater's individual assessment. Future research, which uses two or more coders and focuses on inter-rater reliability may prevent overlapping of categories.

6. What is the relationship between analysis of quality of communication and veteran age, time of day, nurse's years of experience, disposition of call, and symptom?

Veteran age, time of day, and symptom did not have a statistically significant relationship with quality of communication score; however, disposition of call and nurse's years of experience did have a statistically significant relationship to communication score. The communication score was based on eight symptom dimension categories and whether the telenurse addressed the eight categories when communicating with the veteran. Assuming that telenurses documented the communication interaction and information that supported their decisions or showed how they arrived at their disposition of calls, then it appears the telenurses in this study relied heavily on duration of symptom to arrive at and support their decisions and dispositions. Onset, location, character, aggravating/associating factors, temporal, and severity of symptoms were secondarily important supporting information. Relieving factors played an even lesser role.

Communication score and disposition of call had a statistically significant relationship. The telenurses who dispositioned veteran calls to the emergency room had significantly higher communication scores as opposed to the telenurses who dispositioned veteran calls to same-day appointment, self-care, appointment within seven days, and urgent care. The study by Hoare et al. (1999) explored indicators of telephone nursing quality and investigated whether there was a relationship between number of assessment items documented and call disposition. There was no significant relationship between number of assessment items documented and call disposition. The authors went on to say that telephone nurses who are expert at relating to people probably are able to elicit more

information from a caller and therefore document more information.

The relationship between communication score and disposition of call in this study may indicate that telenurses' perception of the seriousness of the symptom-related call influences quality of communication. It may be that the telenurse makes the determination that symptoms that are life-threatening require further telephone assessment of the veteran resulting in an increased diligence in seeking information and/or that the seriousness of the symptom determines how much of the communication interaction is documented.

Conceptual Framework

The conceptual framework upon which this study was based provided further insight into the results that indicate the Telenursing Communication Model was helpful in assessing quality of communication between telenurse and veteran. Interpersonal communication was the interaction between the telenurse and veteran with both parties encoding, interpreting, decoding and transmitting messages. The quality of communication was based on whether the telenurse asked the veteran questions concerning the eight symptom dimensions. If the telenursing note addressed a symptom dimension, communication took place in that specific symptom dimension. For example, if a veteran called with pain, the telenurse communicated to the veteran where, when, what, how, and why and then documented the information (message) from the veteran.

The framework adequately supported the relationship research question regarding quality of communication and nurse's years of experience and disposition of call. The Telenurse Communication Model (adapted version of Schramm's Communication Model) measured communication by assessing the documentation of the message that occurred between veteran and telenurse. The relationship between communication score and disposition of call, with scores being significantly higher, indicates that telenurses ask questions concerning the eight symptom dimensions indicating communication has taken place.

The framework functioned as a guide and assisted the investigator in interpreting the data. The demographic variables veteran and nurse age, veteran gender, location of primary provider, nurse's years of experience, nursing specialty, time of day, and length of call provided descriptive information about VAMC telenurses, veterans, and the telenursing triage call center. Disposition of the call and the nurse's years of experience provided information concerning trends in communication between telenurse and veteran and presented information for future research. For example, do other telenurses' communication scores increase or decrease depending upon disposition of call? Do other telenurses communication scores improve with the years of nursing experience?

Limitations

This study provides additional insight into the problem of communication between telenurse and client during symptom-related triage calls. The limitations of this study are presented and discussed.

The first limitation was the stratified sample did not represent the entire population of subjects. Limiting the location of primary provider to five geographical locations in one state resulted in a large number of veterans being eliminated from the study; therefore, limiting the demographics of the population. Also, stratification of the sample by gender would have increased representativeness among the female veteran population.

The second limitation of the study was the lack of any communication tools designed especially for evaluating quality of communication. Because the investigator-designed tool is new, it has not been validated for use and the appropriateness of the tool may be in question.

The third limitation of the study was collection of data by one coder, the investigator, which increased the risk for biases. Due to these circumstances, the investigator had two graduate-prepared nurses audit the first ten telenursing triage notes for comparison to the investigator's audit in order to assess the investigator's objectivity.

The fourth limitation is that telenurses document the communication exchange, via computer, during the call. The telenurse's level of expertise in using the computer may contribute to quality of communication and documentation during the call. It may be that telenurses with poor computer skills communicate and document less than those telenurses with expert computer skills. Further research is needed in this area.

The last limitation of the study is related to Schramm's (1954) conceptual model of communication. Telenurse's and veteran's perceptions of the communication that

occurred during the telenursing triage encounter may not be consistent with the meaning intended. Perception is influenced by a number of psychological factors, including assumptions based on past experiences, cultural expectations, motivation (needs), moods, and attitudes.

Implications

If 100 million persons are assigned to a telenursing triage service by the year 2001 as projected by Merrill Lynch & Company (2001), the implications for nursing education are significant. The American Nurses Association is promoting the idea that only licensed personnel should conduct telephone triage and consultation, and it is reasonable to expect that licensure examinations will soon reflect both the increased use of technology and the necessity for communicating without face-to-face contact (Nauright, Moneyham, & Williamson, 1999). Faculty members of nursing programs need to facilitate student access to technology and teach students to communicate without heavy reliance on nonverbal cues. Nurse educators need to know how best to teach telephone assessment and communication skills needed for working with a distant client.

The implication for nursing practice is to develop performance standards and guidelines for telenursing triage. The performance standards define the unit-specific responsibilities of the telenurse. Guidelines address issues such as when to make referrals, when personal intervention is necessary, assessing the reliability of the equipment in transmitting information, and other aspects. The development of performance standards and guidelines for management of the telenursing triage

encounter, along with computer-based reminders to complete the eight symptom dimensions, has the potential to improve the quality of communication. However, the effectiveness of these approaches must be concurrently monitored as part of the overall strategy for improvement of the telephone triage process.

Recommendations

The practice of telenursing triage provides a wealth of opportunities for qualitative and quantitative research. Significant opportunities exist for research on the legal and ethical aspects of telenursing triage including confidentiality, scope of practice, certification and credentialing, and liability of providers. In regards to nursing practice, research is needed in the areas of quality of care, outcomes, client satisfaction, client compliance, and access to care. Research is also needed to determine the knowledge skills and experience needed for effective performance.

Since the telenurse-client relationship is a core component of nursing practice, research is needed to determine what impact there is on the relationship when the nurse may never have in-person contact with the client. Telenursing triage call centers need data about the knowledge and skill sets associated with effective practice. Research is needed in the area of outcomes and cost-effectiveness of telenursing triage. Also, research is needed to determine if documentation of telenurse-client calls truly reflect communication.

The author recommends further communication research between telenurse and client using conversational analysis and the development of an instrument that meets all

validity and reliability criteria. Finally, this study should be replicated using a larger sample size and should encompass the entire geographical area the telenursing triage center services.

As for telenursing education, it is recommended that nursing curricula incorporate telenursing triage nursing practice. Communication issues should be discussed in relation to the use of assessment strategies over the telephone. Providing classes and software tutorials for initial computer training related to telenursing practice, compiling case studies for listening to actual calls, and role-playing should assist the new nurse in improving their communication skills.

Summary

This retrospective study explored selected characteristics of telenursing triage. Communication scores were analyzed and a relationship between nurse's years of experience and disposition of call were evaluated and found to be statistically significant. There was no statistically significant relationship between communication score and veteran age, time of day, and symptom. This research study adds to the existing data on telenursing triage.

Appendix A
Content Analysis of Quality of Communication and Selected Variables

**CONTENT ANALYSIS OF QUALITY OF COMMUNICATION AND SELECTED
VARIABLES**

A. Client Characteristics

Client ID# _____

Client Age: _____

Client Symptom: _____ (Will be assigned codes after data collection).

Is the caller the client? 1 – Yes 2 – No

If no, relationship to client? 1 – spouse 2 – relative 3 – caregiver 4 - friend

Gender of Caller:

Value	Label
1	Male
2	Female
3	No information

Location of Primary Provider:

Value	Label
1	Dayton
2	Cleveland
3	Columbus
4	Chillicothe
5	Cincinnati

B. Nurse Characteristics

Nurse ID# _____

Nursing – Years of Experience: _____ Nurse Age: _____

Nursing Specialty: 1 – Critical Care 2 – Med/Surg

C. Telephone Call Characteristics

Time of Day: _____ (Military time).

Length of call: _____ (Minutes)

Month call received:

Value	Label
1	March
2	April
3	May
4	June

Levels of Disposition Advice:

Value	Label
1	Emergency room
2	Same day appointment
3	Self-care
4	Appointment within seven days
5	Urgent – within 2 hours

D. Content Analysis of Symptom Characteristics

Symptom Characteristic Categories		Word, Phrase, and/or Sentence (for audit)
Value	Label	
1	Onset	_____
2	Location	_____
3	Duration	_____
4	Character	_____
5	Aggravating/associating factors	_____
6	Relieving factors	_____
7	Temporal factors	_____
8	Severity of symptoms	_____

Scoring

Analysis of Quality of Communication

4 = excellent (documentation of the eight symptom characteristic categories in the telephone nursing note).

- 3 = above average (documentation of six of the eight symptom characteristic categories in the telephone-nursing note).
- 2 = average (documentation of four of the eight symptom characteristic categories in the telephone-nursing note).
- 1 = below average (documentation of two or less of the eight symptom characteristic categories in the telephone-nursing note).
- 0 = extremely poor (no documentation of the eight symptom characteristic categories in the telephone-nursing note).

C. Definitions for Categories of Symptom Characteristics

1. Onset – date and time of onset of symptom, manner of onset (gradual or sudden), precipitating and predisposing factors related to onset (emotional disturbance, physical exercise, fatigue, bodily function, environment, injury, infection, toxins or allergens).
2. Location – where symptom is located (anatomic region) and if pain radiates.
3. Duration – continuous or intermittent and duration (short, long) of each episode, plus temporal relationship to other events).
4. Character – quality (burning – hot, stinging), (bright, pricking – sharp, cutting, knifelike, lightening-like), (deep, aching – boring, pounding, sore,), and (deep pain – throbbing, cramping), quantity and consistency.
5. Aggravating/associating factors – any action (bodily movement) that makes the symptom worse.
6. Relieving factors – any action (bodily movement, over-the-counter medications, etc.) that makes the symptom better.
7. Temporal factors – other symptoms/events associated with primary symptom.
8. Severity of symptoms – intensity, pain scale 1-10 with 10 being most severe or patient relates severity to a common experience such as a toothache, menstrual cramps, labor pains, or a sore throat.

Appendix B
Institutional Review Board Approval - WSU



Office of Research and Sponsored Programs
 201J University Hall
 3640 Col. Glenn Hwy.
 Dayton, OH 45435-0001
 (937) 775-2425
 (937) 775-3781 (FAX)
 e-mail: rsp@wright.edu

DATE: June 11, 2001

TO: Christine Renee Lowery, P.L., Student
 Janet S. Fulton, Ph.D., Fac. Adv.
 VAMC & College of Nursing & Health

FROM: Robyn James, Sponsored Programs Assistant *RJ*
 Secretary, WSU Institutional Review Board

SUBJECT: SC# 2467

A Retrospective Study: Exploring Selected Characteristics Of Telephone Nursing Triage

This memo is to verify the receipt and acceptance of your response to the conditions placed on the above referenced human subjects protocol/amendment.

These conditions were lifted on: June 11, 2001

This study/amendment now has full approval and you are free to begin the research project. This implies the following:

1. That this approval is for one year from the approval date shown on the Action Form and if it extends beyond this period a request for an extension is required. (Also see expiration date on the Action Form)
2. That a progress report must be submitted before an extension of the approved one-year period can be granted.
3. That any change in the protocol must be approved by the IRB; otherwise approval is terminated.

If you have any questions concerning the condition(s), please contact me at 775-2425.

Thank you!

/rdj

Enclosure

RESEARCH INVOLVING HUMAN SUBJECTS

SC# 2467ACTION OF THE WRIGHT STATE UNIVERSITY
SCREENING COMMITTEE

Assurance Number: M-1021; ID No. 01NR


Title: *A Retrospective Study: Exploring Selected Characteristics Of Telephone Nursing Triage*

Principal Investigator: Christine Renee Lowery, P.L. Student
Janet S. Fulton, Ph.D., Fac. Adv.
Department: VAMC & College of Nursing & Health

The Institutional Review Board Screening Committee has approved the use of human subjects on this proposed project with conditions previously noted. The conditions have now been removed.

REMINDER: FDA regulations require prompt reporting to the IRB of any changes in research activity, changes in approved research during the approval period may not be initiated without IRB review (submission of an amendment), and prompt reporting of any unanticipated problems (adverse events).

NOTE: This approval has been assigned an "SC" number in our system, which means it has been approved by the Screening Committee for a protocol involving no more than minimal risk.


Signed _____ Coordinator, WSU-IRB
Screening Committee Date: June 18, 2001
IRB Meeting Date: June 18, 2001

Appendix C
Agency Permission for Conduction of Study

Wright State University-Miami Valley
College of Nursing and Health

AGENCY PERMISSION FOR CONDUCTING STUDY

THE Veterans Administration Medical Center

GRANTS TO Christine Renee Lowery

a student enrolled in a program of nursing leading to a Master's degree at Wright State University, the privilege of using its facilities in order to study the following problem: A RETROSPECTIVE STUDY: EXPLORING SELECTED CHARACTERISTICS OF TELENURSING TRIAGE.

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) ~~-(does not want)-~~ a conference with the student when the report is completed.
4. Other: _____

Date: 7-17-01

Lyn Chy H3/R+D
Signature of Agency Personnel/Title

Christine R. Lowery
Christine R. Lowery, BSN, RN
Signature of Student

Janet Fulton
Janet Fulton, Ph.D., RN
Signature of Faculty Director

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